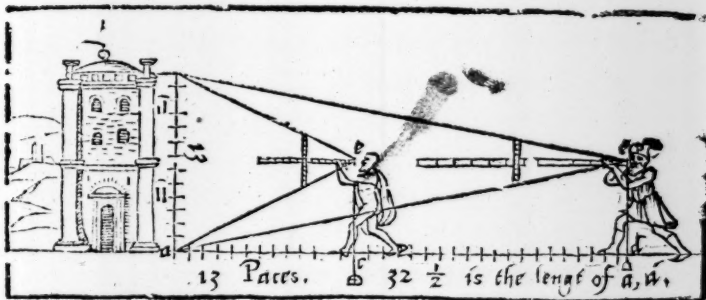


BOOKE NAMED TECTONICON,

Briefly shewing the exact measuring, and speedie reckoning all manner of Land, Squares, Timber, Stone, Steeples, Pillers, Globes, &c. Further, declaring the perfect making and large use of the Carpenters Ruler, containing a Quadrant Geometricall: comprehending also the rare use of the Squire. And in the end a little

Treatise adioyning, opening the composition and appliancy of an Instrument called the Profitable Staff. With other things pleasant and necessary, most conducible for
Surveyers, Land-meaters, loyners,
Carpenters and Mafons,

Published by LEONARD DIGGES Gentleman, in
the yeere of our Lord, 1556.



LONDON,
Imprinted by Felix Kyngston.

1634.





L.D. To the Reader.




Although (gentle Reader) many excellent in Geome-
try, upon infallible grounds, haue put forth diuers
most certaine and sufficient Rules, touching the
measuring of all manner Superficies: yet in that
the Art of numbring hath bene required, yet chief-
ly these Rules hid, and as it were locked up in strange Tongues,
they doe profit (or haue furthered) very little the most parts: Certainly
nothing at all, the Land-measter, Carpenter, Mason, wanting the
aforesaid. For their sakes I am here prouoked not to hide, but to
open, and so encrease the Talent which I haue received: yea, to
publish in this our Tongue very shortly (if God give life) a volume
containing the flowers of the Sciences Mathematical, largely appli-
ed to our outward practise, profitably pleasant to all manner men
in this Realme. In the meane time I shall desire the Artificers aboue
named, to bee contented with this little Booke (a taste of my good
will towards them) which I wish euen so to further the Readers, as
I know it sufficient for the true measuring and ready account of all
manner Land, Timber, Stone, Boord, Glasse, Pavement, &c.

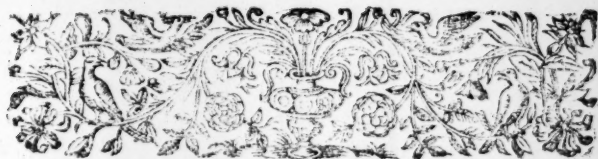
Here mine aduise shall bee to these Artificers that will profit in
this, or any of my bookes now published, or that hereafter shall be,
first carefully to reade them thorow, then with more indgement.
Reade at the third reading, wittily to practise: So few things shall
be unknowne. Note, oft diligent reading, ioyned with ingenious
practise, causeth profitable labour.

Thus most heartily farewell (loving Reader) to whom I wish
my selfe present, to further my desire and
practise in these.

THE PLEASANT PROFIT OR
content of this little Booke, and in what it
exceedeth all other published.

 Ther Bookes tofore put south in our English tongue, contained onely the bare measuring of Land, Timber, and Boord: how agreeable in all places to the rules of Geometric, let the learned iudge. Here (gentle Reader) thou shalt plainly perceiue through diligent reading, how to measure truely, and very speedily all manner of Land, Timber, Stone, Steeples, Pillers, Globes, Boord, Glasse, Pauement, &c. without any trouble: not painted with many rules, or obscure termes, nor yet with the multitude of Tables, as heretofore hath bin: in which not a few errors were committed: for that cause no iust account might any way bee had. Further, ye shall by this Booke vnderstand the whole making and comely handling of the Carpenters Ruler, with the true measure, &c. And his vse appointed to the ready measuring of all kinde of Timber, Stone, Boord, &c. Also the leueling of grounds, and taking of heights, is pleasantly and diuersly practised by the Ruler. Yee haue here not the common, but the rare vse of the Square, applied to heights, lengths, &c. And to the finding of the iust houre of the day diuers wayes, through the aide of pleasant Tables newly adioyned to my generall Prognostication: by the which the proportion of things, direct or squirewise standing, are by their shadowes knowne.

To conclude, in the end of this Booke is added a Treatise, shewing the making, and vse of an Instrument, by which yee shall get lengths, heights, breadths, widenesses, where or howsoever they stand. Other necessary things are contained in this little volume, which I commit to the diligent Reader.



DIVERS THINGS

CONDVICIBLE TO THE

ART OF MEASVRING.

The first Chapter.



So there are few Craftsmen which haue all the kindes of Arithmetike readily: so I doe suppose none so ignorant, but that they doe or may easily perceine the simple significations of these Characters or figures, 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. And also their strength in the first, second, and third rowes placed.

Characters
numeraill.

Besides that, they must bee familiar with these and such like fractions.

$\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$ $\frac{1}{5}$ $\frac{1}{6}$ $\frac{1}{7}$ $\frac{1}{8}$ $\frac{1}{9}$ $\frac{1}{10}$. The first leftward betokeneth one second part of an whole, bee it Pearch, Inch, or any other measure: the next, one third, then one seuenth part: the other ensuing one sixteenth. So one thirty and two parts of an Inch. Then follow three fourths: foure fifths. The last is nine tenths of an Inch: that is, nine parts of an Inch, diuided into tenne portions.

Fractions.

These I doe intend to put in my Examples, and in my Tables and margines following, to represent parts of Pearches or Inches. As if I would write halfe an Inch, after

The Art of

this manner $\frac{1}{2}$. Three quarters of an inch thus $\frac{3}{4}$. One eight of a Pearch, on this wise $\frac{1}{8}$. So of the rest.

It is requisite also heere to open what a Pearch, a Day worke, a Roope, and an Acre is.

Although there are diuers opinions engendred thorough long custome in many places, of the length of a Pearch (vpon which our chiefe matter dependeth) yet there is but one true Pearch by Statute appointed to measure by. Wherein is ordained three Berly cornes dy and round, to make an Inch: twelue inches, a Foote: three Foote a Yard: five Yards, $\frac{1}{2}$ a Pearch: foure Pearches is length, and foure in breadth, an Acre. So an Acre by Statute ought to containe 160. Pearches; the halfe Acre 80. Pearches; a Roope, commonly called a quarter. 40. Pearches, a Day worke 4. Pearches. Loe heere the Acre expressed with his length and breadth.

Acre.		Length.
1	160	
2	80	
4	40	
5	32	
8	20	
10	16	Breadth.

Instruments to
measure with
Poales,
Cord knotted,
Profitable
staffe,

I must not omit heere to tell you what thing is meetest to measure Land with. They be commonly in the countrey two Poales, either of them the length of a Pearch. They are very good: yet for all kinde of Land, a Cord five Pearches in length, well seared with ware and rosen, knotted or marked at the end of euery Pearch, is more meete and readier. But in my fantasie, the instrument Geometrical, which is put forth in the end of this Booke, passeth them all and other, for the exact truth and quickest speed. This Instrument is so generall and auailable to so sundry things, that it alone requirerh a large Booke, if it should be sufficiently set forth.

Triangle.

Line falling
Squirewise.

Also I would not haue you ignorant what piece of Land is called a Triangle, which often shall hereafter bee named. It is such a fashioned piece as hath (or is imagined to haue) thre sides, and thre Angles onely: whether the sides bee equal or other wise, as this figure sheweth. Againe, note that a line is said to fall Squirewise, when it cutteth any thing, or any of a Triangle full crosse, like vnto a Squire: As the hanging pyked

measuring of Land.

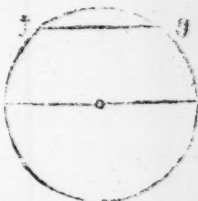
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pricked line a. b. in c. d. the base line of the Triangle. For it cutteth the side squarewise, or full cross, in the point c. and not as the other line e. c. both. The base of any Triangle is here called that line, which is cut squarewise of the hanging line,



Base line.

Concerning a Circle, know, that the compass of any Circle is named a Circumference: the middle point in him his Center: the right line h. i. that goeth overwhart that Center touching the Circumference on both sides is his Diameter: the halfe of that line, the Semidiameter. Also an Arch is a piece of the Circumference cut away: as yee see the Arch about the line f. g. Also f. g. h. i. in this Circle are named parallels: for that they differ equally in all places, the one from the other.



Diameter
Semidiameter

Arch.

Parallels.

Note because practise and experience sheweth me, that there is almost no Land, but it may easily be brought by imagination to a Triangle or Triangles, and so most truly measured: therefore, to be short, this order shall bee taken: I will first figure and set afore your eyes Triangled Land, and other which by imaginations shall bee brought into Triangles. Then I shall teach the true measuring of them: I meane, how to finde a length and breadth, with which yee shall enter the table of account following, where the Acres and odd Pearches (if there bee any) shall appeare. As these figures are measured, so all Triangled Land, and other brought into Triangles, of what fashion so ever they be, shall be measured. And because it is requisite for true measuring of all Triangles, to finde a straight hanging line, I shall shew first how that line is to bee found, imagined, or drawne,

How

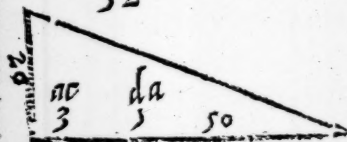
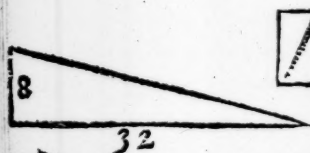
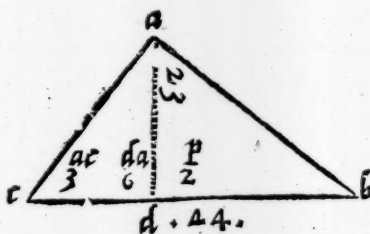
The Art of

How the right hanging line in Triangles is drawne.

The ij. Chapter.

To draw a
hanging or
plumbe line.

This straight hanging line in all Triangles is euer drawne or imagined from any Angle, cutting some one Side of that Triangle squirewise: as yee may perceiue the pycked lines in the Triangles following. By the helpe of this line, all Lands of Triangle fashion, are brought to bee measured as ensueth.



How

measuring of Land.

3

How to measure all manner Triangled Land.

The iij. Chapter.



F thou bee an Arithmetician, multiply this Euclid. the 1. Booke 41. pro. Freight hanging line, drawne, as aboue is shewed, in halfe the number of Pearches of that side, which it cutteth Squirewise. For want of the knowledge, take the afozenamed Pearches (I meane of the hanging line, and halfe the side which he cutteth) and with that length and breadth enter your table of account, as there is set forth. So shall ye perceine the number of Acres, Roods, Daywokes, &c.

Example.

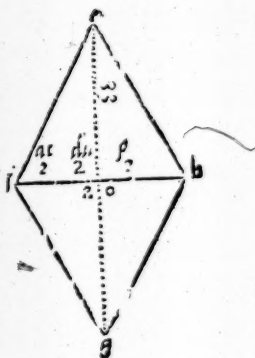
For the perfect measuring of Triangles afoze figured, and all other, suppose the second of these last nine figures of the other side, hauing written aboue it a. b. c. d. to bee a peece of land, whereof I would haue the true measure, I finde by a Cozde, otherwise, the pricked hanging line a. b. to bee 23. Pearches: the side b. c. which it cutteth squirewise 44. Pearches, whose halfe is 22. With these 22. and 23. the conuenient length and breadth, I enter the table of account. Where I finde by that Table at the corner where both the lines of conuenient length and breadth doe meete 3. Acres, 6. day wokes, and two pearches to be in that Triangle. Thus of all befoze figured.

Here note your Table must euer bee entered with all the Pearches of the hanging line, and with halfe the side that hee cutteth squirewise. This Table followeth. Or with the halfe hanging line, and the whole side cut.

The Art of

A figure of a double Triangle.

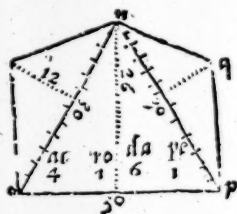
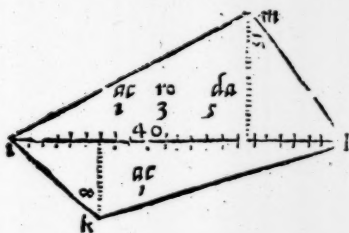
This figure c.f.g.h. is but two Triangles: and therefore measured as above in two parts. **O**p thus: The hanging line c.g. is 33. Pearches: the side f.h. that bee cutteith squirewise 20. Pearches, the halfe of the which is 10. Now enter your Table as afoze, with 33. and 10. the convenient length and breadth. So shall yee finde two Acres, two Daywozkes, and two Pearches, the true content of this figure c.f.g.h.



Figures of many Angles.

Another example.

Admit i.k.l.m. land to be measured. Because it is no manner Triangle, it must be brought by imagination, as I have said, into a Triangle or Triangles. Which imagination is heere signified by the line dashed i.l. Then as above is



declared, it ought to bee measured (according to the rule of Triangles) in two parts, because there are two Triangles in that land. So by prooffe ye shall find in the upper i.k.l. one Acre, 33. Roodes, and five Daywozkes: in the other i.k.l. one Acre. Thus I gather the whole content of that Land, to bee two Acres, thre Roodes, and five Daywozkes.

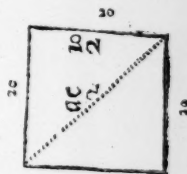
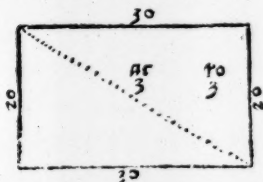
None

measuring of Land. 4

None otherwise of the adioyned n. o. p. q. and all other figures following: and other whatsoever they are, that by any means may be brought into Triangles.

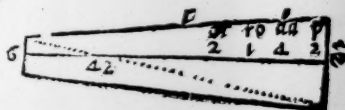
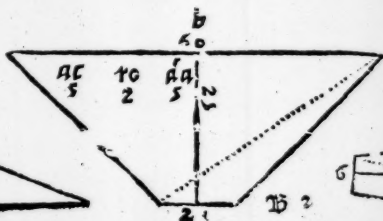
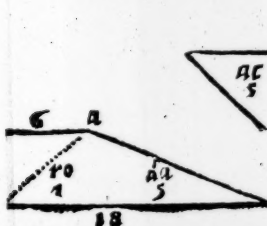
Furthermore know that the figure i. k. l. m. is readily thus measured. Adde the Pearches of both the hanging Lines together: so haue pee 23. With this number, and with halfe the Pearches of the side, i. l. which he cutteth squirewise, being 10. Pearches, enter your Table. So is found as afoze.

These two figures following may also bee thus measured, otherwise then by the rule of Triangles. Enter your Table with their conuenient length and breadth. So shall you finde the contents of all such.



These three figures following, although they may be measured by the rule of Triangles, yet for quicker speede, they haue also their proper measuring as ensueth.

Lay together the two sides which are paralels of the first figure a. that is 6. & 18. making 24. the halfe is 12. the breadth 5. Enter with 5. and 12. your table. So haue you one roode, and five day wozkes. For the other two b. c. and such like, toyne the heads or ends in one: and enter your table with halfe of those Pearches, and with the whole number of the middle line.



The Art of

How by supputation to measure all triangled land.

To measure
triangled land
by supputation.

Ioyne all the sides together: take halfe out of that halfe, I pull euery side, noting the difference. Then multiply the differences, the one in the other, and the third difference augment in the product. That which encreaseth, multiply in the halfe of all the sides ioyned. Then the Radix of the surmounting summe is the content of that Triangle.

four rules
following.

Now rest foure Rules to bee treated of. The first for all manner Regular square Superficies. The second for round Land, and her parts. The third for Steeples, Columnnes, Globes, and their parts. The last for Mountaines, and Valleys. Here they shall in order follow.

A rule for all manner Regular or right squared Land of many sides, as 5.6.7.8.9.10.20.100.&c.

The iij. Chapter.

To measure
land of many
sides.



Masure and lay all the sides together, taking the halfe number of Peaches there contained. Then draw a right hanging line from the Center or middlest of that figure, or the middlest of some one side. And with that length and the other, enter your Table. Note that the Triangle of all sides like, and the Quadrate figure are also measured by this rule.

Ensample.

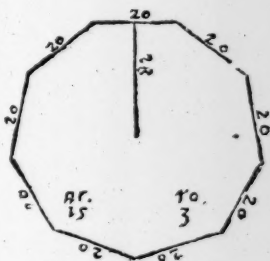
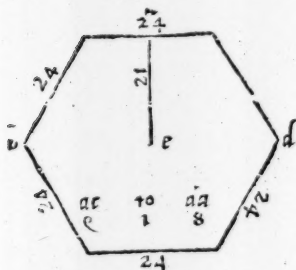
Suppose this figure a.b.c.d. to bee a fire square peece of Land, and euery side 24. Peaches. The halfe summe of
all

measuring of Land.

5

all sides is 72. Peaches: the right hanging prickled line a.c.
21. Peaches. With these two numbers we must enter your
Table of account following hereafter. And doe as is opened
in the declaration there adioyned, when Numbers surmount
the Table as they doe here.

So shall ye finde 9. Acres, 1. Rood, and 8. Dayworkes, the
content of this figure a. b. c. d. Even thus is the other nine
squared figures measured, and such like.



A Rule for round Land, and the parts thereof.

The v. Chapter.



Also the Diameter multiplied in halfe the Cir-
cumference, sheweth the content of any Circle.

Or thus more plainly. Ye shall enter your
Table with halfe the number of peaches of the
whole Circumference or compasse, and with
the number of halfe the Diameter or breadth. So haue ye
the Content.

Archimedes in
libello circuli
mensurationis.

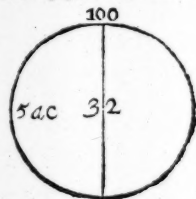
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Example,

The Art of

Example.

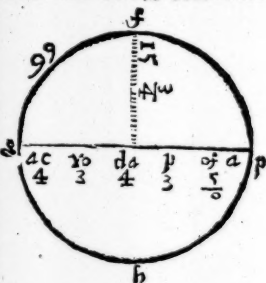
Suppose a peece of Land, whereof the compasse is 100. Pearches, the breadth 32. Pearches, I would know how much Land is in this figure. Enter your Table with halfe the compasse, that is 50. and with halfe the breadth, that is 16. Pearches. Because in the Table I cannot finde 50. for the greatest length is 40. (therefore I enter with 40.) and 16. So is found foure Acres. Then I enter againe with 16. Pearches remaining, and 16. the breadth as before, that bringeth 1. Acre. Now to conclude by addition of 1. and 4. I finde five Acres in that round Land, whose halfe compasse is 50. Pearches, and the breadth 16. Pearches.



How parts of Pearches are to be counted in measuring.

For perfect knowledge and use of this Table following, when parts of Pearches are adioyned, note well this other example that ensueth, and also what is said of the declaration annexed unto the table, when parts of Pearches are in the length, breadth, or both.

Imagine f.g. h. to bee a round peece of Land: I finde by measure the whole Compasse, 99. Pearches. The halfe is 49. $\frac{1}{2}$. The hanging Line or halfe breadth is 15. $\frac{1}{2}$. Enter your Table with the whole Pearches, that is 49. and 15. leaving out $\frac{1}{2}$. and $\frac{1}{4}$. which were but parts of Pearches. So haue



measuring of Land.

6

pee 4. Acres, 2. Roodes, 3. Daywozkes, and 3. Pearches. For those parts of Pearches omitted, at your first entring the Table, worke thus. The halfe Pearch, Quarter, or other part of a Pearch in the length, must be reckoned by themselves in the whole breadth, and those of the breadth contrariwise in the length. If there bee such odde parts in both, then reckon them of the length in the whole breadth, and them of the breadth in the whole length, ioyning to the other afore gotten, remeinbring the product of the one fraction multiplied in the other, to bee pulled from the encrease. To make this matter plaine, I will take this last example before. The one number wherewith I should haue entred my table, was $49\frac{1}{2}$. the other $15\frac{1}{2}$. I found first by entring with 49. and 15. (omitting the odde parts) 4. Acres, 2. Roodes, 3. Daywozkes, and 3. Pearches. Now for the encrease of the parts of Pearches left out, I must (as I said) reckon them of the length in the breadth, and contrariwise them of the breadth in the length. Halfe $15\frac{1}{2}$. is 7. Pearches, and $\frac{1}{2}$. Three quarters of 49. is 37. Pearches $\frac{1}{2}$. Which added, makes 45. Pearches. This adioyned to the number afore gotten, bringeth the whole content of the round figure, which is 4. Acres, 3. Roods, 4. Daywozkes, 3. Pearches, and $\frac{1}{2}$. of a Pearch, the product of the one fraction multiplied in the other subtracted. What must be done when the numbers wherewith yee should enter, exceede your table, counsell the declaration of your table there adioyned.

Of the halfe Circle.

For this halfe circle, enter the Table with halfe the compasse, and with halfe the Diameter of the Circle, or with the length of the picken hanging line, k.l. So the content of this halfe Circle is 2. Acres. 1. Rood, 7. Daywozkes, 1. Pearch, and $\frac{1}{2}$. of a Pearch.



To measure
halfe circled
Land.

Another

The Art of

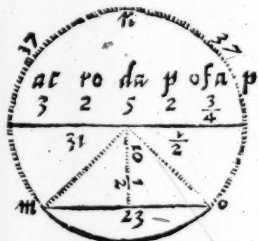
Another example of Portions and parts of a Circle.

To measure
parts of circled
Land.

Suppose n.m.o. following, were part of a Circle or peece of Land, whose Content is desired. The whole compasse of the Circle which this portion representeth, is (as aforesaid) 99. Pearches: his Diameter or breadth 31. $\frac{1}{2}$. The prickd Arke, or Compasse, n.m.o. is 74. Now with the halfe Breadth or Semidiameter of the Circle, 15. $\frac{1}{2}$. and with 37. the halfe of the prickd Compasse: enter your Table. So haue yee 3. Acres, 2. Roodes, 5. Day workes, 2. Pearches, and $\frac{1}{4}$. of a Pearch, the Content of the peece of Land full of prickes, to the sides of the Triangle prickd.

If ye desire to know the sum of Pearches in the other portion beneath the Triangle, separated by the Line m.o. yee must adde the Content of the Triangle (which is 3. Roodes and $\frac{1}{4}$. of a Pearch, found by the Rule of Triangles) to the Acres and Pearches before searched. So haue ye 4. Acres, 1. Rood, 5. Day workes, three Pearches, and $\frac{1}{4}$. of a Pearch.

This subtracted or pulled from the number contained in the whole Circle, the remaine is the Pearches included in the small peece beneath the Triangle. That is, 1. Rood, 36. Pearches, and $\frac{1}{4}$. of a Pearch.



How mixed Figures are measured.

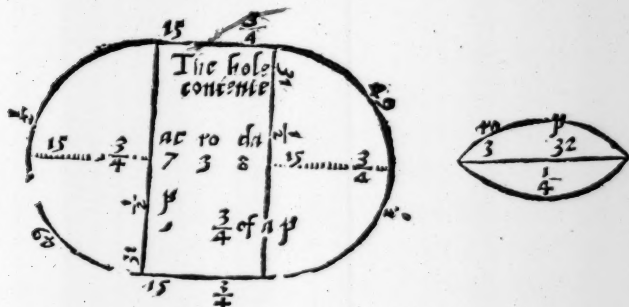
Land com-
pounded of
circles, or his
parts.

I thinke none now will doubt how these two figures fol-
lowing are measured, because they are made of portions or
parts of Circles, whose measure is before sufficiently open-
ned

measuring of Land.

7

ned, the one consisting of two halfe Circles, and a Quadrangle: the other being the portions of the Circle, m.o. doubled.



If any euill fashioned Land chance to bee measured, which requireth to be brought into many Triangles, to saue labour, yee may adde some portion vnto that, and make it Square, or otherwile. So let them bee measured: and after, from the product pull away that yee added: the remaine is the Content.

To finde the content superficiall of Steeples, Columnes, Globes, and their parts.

TO the Arithmetician, I say: for picked Steeples, multiply the whole side in halfe the circumference of the Base, adding the plaine of that Base. For pillers: augment the Circumference of the Base in the Heights, putting to the plaine of both Bases. For Globes, the diameter in the Circumference multiplied. Euen so of fragments or parts. Let them that bee void of Arithmetike enter my Table of account following, with such numbers as I now willed the Arithmetician to multiply, not forgetting what I haue before written. So I serue their turne.

To measure Steeples, Columnes, Globes, &c.

C

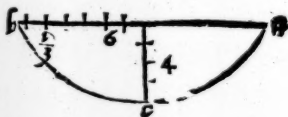
Or

The Art of measuring

Or thus by the rule of proportion, the parts of a Globe are found.

To measure parts of Globes.

Suppose a. b. c. to bee a Spiece of a Globe, and 4. to be a proportion of the Diameter, the whole being 14. Thus I say, 14. the whole Diameter giueth 616. the Content superficiall of the Circle: what shall 4. bzing: So haue yee 176. which is the Content of that pice.



To finde the Diameter by some knowne portion thereof.

To finde the vnknowne Diameter of a Globe.

If ye bee ignozant what length the Deameter of the Globe is, whose proportion ye haue, the height or part of the Diameter being 4. foot, augment halfe the line a. b. which is 6. in himselfe, and the product diuide by 4. So haue yee 10. to be added to 4. which maketh 14. the whole Diameter.

The true measuring of Mountaines and Valleys.

The vi. Chapter.

To measure Mountaines.



First ye shall measure the circuit of the Foot, or Base of the Mountaine: then the compasse of the summit or top, adding them together. So shall ye doe of the Ascensles, that is, the going vp from the foot to the top, ioyning the measure of the longer and shorter in one. Now take the halfe of the circuit added, and the halfe part of the Ascensles ioyned, and enter you table: there shall ye see the Content.

Ensample.

Ensample.

A. b. c. is the mountaine: a. c. the circuit of the Base, being 100. Pearches, b. the top 16. Pearches. Which ioyned together, make 116. b. c. the one Ascent is 55. Pearches: the other 75. These added make 130. The halfe of the circuits is 58. the halfe of the Ascens 65. with these two summes yee shall enter your table of account, where ye shall find 23. Acres, 2. Roodes, and 10. Pearches, the true content of this figured hill.

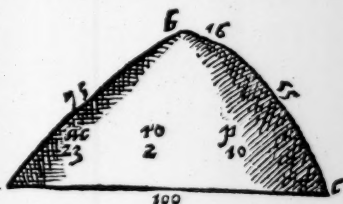


Figure of a Mountain.

Of the Valley.

AS in the Mountaine yee measured the circuit or compasse To measure
of the Base or Foote: so here contrary yee shall meete Valleys.
round about the circuite or compasse of the height of the Val-
ley. And as yee got the measure or compasse of the top of the
Mountaine, so measure the circuit of the depth of the Valley.
In like manner as yee measured the Ascent, that is, the go-
ing by from the foote to the top: so measure the Descense or
going downe of the Hill to the depth of the Valley. The rest
all worke, as I haue shewed you in measuring the Mountaine.
For more plaine-
nesse, behold this
ensample or fi-
gure. If yee lay
together the cir-
cuits of the
height and depth,
which is 210.
and 30. taking the halfe art of those two Circuits, making

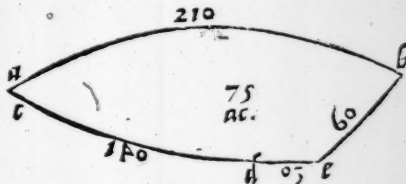


Figure of a Valley.

The Art of measuring

an 120. then the two Ascenses 140. and 60. added in one product 200. the halfe thereof being 100. with this and 120. the other halfe of the Circuite, ye may enter your table. That doing, loe 75. Acres.

How the Table of account now following, is to be vsed.

What isto bee done when numbers, with which you should enter, exceede your Table.

When you haue gotten a conuenient Length and Breadth (as I haue aboue declared by diuers triangles and other figures) then you shall enter this Table. Seeke there the Length, and most number of Pearches in the higher margine, which beginneth at 1. and endeth rightward at 40. Looke the other summe of Pearches (I meane the breadth) in the right side and hanging margine, from 1. descending to 30. Now at the meeting of the lines, where the one answereth the other directly in a square, you shall finde the Acres, Roodes, Day workes, and Pearches. Note that the first number set on the left side, and vpper part in any square, signifieth the number of Acres. The figure 1. set in the vpper part, and right side, doth betoken a Roode: the figure 2. there two Roodes. 3. three Roodes. And the figure in the left side beneath, signifieth a Day worke, or Day workes. A figure in the lower part rightward, declareth Pearches.

A Declaration adioyned.

When it chanceth that the one number or both with the which ye should enter this table, are greater then any here found: it becometh you to take the halfe of the one, and the whole of the other, or what parts ye list of both, most commodious for your purpose, and so enter your table. Looke then what is there found, and it shall beare his name of the parts multiplied in themselves.

Ensample.

Ensample.

Suppose the number with the which pee should enter your table to bee 130. Pearches in length, and the breadth 60. neither of these may be found in the Pargines: wherefore I take the third part of an 130. which is 34. Pearches, and ene remaineth.

The halfe 60. that is 30. I finde with entering them at the common meeting, 6. Acres, 1. Rood, and 5. Day workes. This summe must haue his name of the parts augmented in themselves. I tooke the third part of the one, and halfe the other number, therefore 2. must be multiplied in 3. or contrarie: so haue ye sixe, which signifieth that ye haue found by entering, but the sixth part of the number ye should finde. Wherefore I must take this summe tofore found (being Acres, 1. Rood, and 5. Day workes) sixe times as much. So haue ye 33. Acres and one Rood. For the Pearch remaining in length, reckon him in the breadth (as is afore declared) in the fifth Chapter of the Remaines: so haue pee 60. Pearches more to be added. So the encrease of these two numbers, 103. and 60. amount to 38. Acres, two Roodes, and 5. Day workes. Thus any manner length and breadth is reduced to this table following, which sufficeth.

Looke what I
hane shewed in
the Chapter of
parts, that vnder-
stand here
of whole Pearch-
es, left sub-
tracting, &c.

Thus with few words is ended the certaine measuring of all manner Land, touching the Superficiall Contents. Wherefore now shall follow the true measuring of Timber, Stone, Steeples, Pillers, Globes, according to their Circumference.

Such as are altogether ignorant of Arithmetike, may reckon by our English coyne, allowing for euery Pearch in length or breadth a penny, and so euery Parke makes an Acre, euery Noble halfe an Acre, euery forty pence or halfe Noble, a rood, and euery penny a square Pearch. And so by memorie without tables, may in some rude and grosse manner, cast by reasonable iust the true Contents of all Closes, Meadowes, Parkes, Hills or Valleyes.

TABLE

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
5	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
6	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
7	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
8	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
9	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
10	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
11	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
12	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
13	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
14	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
15	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

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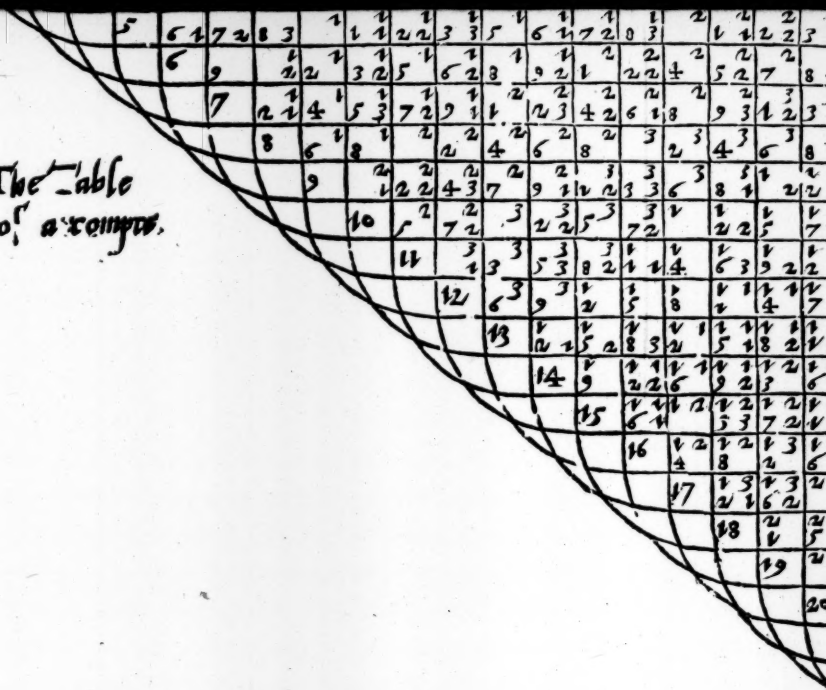
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of a xempus.

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2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
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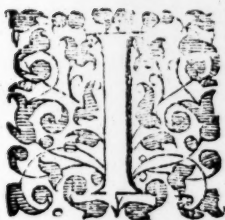
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This image shows a blank, aged, cream-colored page, likely an endpaper or flyleaf from an old book. The paper has a slightly textured appearance with some minor discoloration and small dark spots, possibly due to age or handling. A vertical crease is visible near the left edge, and the overall tone is a warm, off-white or light beige.





To the Reader.



T commeth commonly to passe, that Carpenters, Masons, and such like Artificers, are put either to measure timber every way square, or squared logs, broader on the one side than on the other: yea many times mutilate or vnperfect stufte. Sometimes three, fve, tenne, or twenty, square in the head, and so through: oftentimes round

Stone or Timber with hollowed, &c. Afore I shew vnto them what must bee done with such pieces of Timber or Stone, to get their true measure, my desire shall bee that such Craftsmen will leaue to be heady or selfe willed: yea so greedily to sticke to their corrupted rules, that vtterly they refuse to be taught.

Both learning and experience declareth vnto me, that the grounds which the best of them haue, are false. To open how and where, it needeth not: neither doth it appertaine to instruction, onely it may suffice him that liketh the true way, here to receiue it appointed to him. Yet to satisfie and content him which will not belecue any such errours or false grounds to bee, I say (and truely) that the Ruler of Timber measure, which the most part of them hath, is not made by right Art: Besides that, their craft in seeking the Square of some Timber is very false. They vse in measuring, to lay the broader and narrower sides together in a summe, and to take the halfe of that number for the Square. Then they seeke this vntrue Square vpon the false Ruler, and so measuring the Timber, they conclude of it vntruely.

To the Reader.

In a foote
square is con-
tained 172.
Inches.

As this is corrupted, so are other Grounds which they take to be infallible. Now to the purpose: touching the correction of those Errours, with other not mentioned, whereby true measuring may ensue, this way shall be taken. After I haue opened how you must handle all such fashioned Timber (as afore is spoken of) there shall follow a Table in which yee may finde (as I will declare) the Square of any Stone or Timber. That knowne, it is requisite to haue another Table immediately following, which may appoint to all true Squares from 1. to 6. inches, the iust length to make a foote euery way Square. With the length agreeable to your Square, your Logge must bee measured. And as oft as ye finde it from the one end to the other of your Timber, so oft you may conclude the foot Square to bee contained in that Timber Logge, or Stone: that is, so many Square Feet there to bee included. This Table of Timber measure standeth in the place of a good Ruler, well decked with true measures. By this yee may make or correct Rulers at pleasure, as after appeareth.

*Now orderly followeth the true measuring of all fashioned
Timber or stone aforesaid.*



How Timber or Stone fouresquare euery way, or broader on the one side than on the other, is measured.

The vij. Chapter.

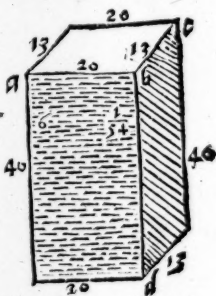
IF a piece of Timber or Stone, bee either equally square, broader on the one side, than on the other, yee shall take the iust measure, I meane, how many Inches the broader side containeth: euen so of the narrower. This done, yee must seeke in the Table of Squares following, the measure of the broader side of the Timber or Stone, in the vpper margine of that Table. Then looke for the number of Inches, of the equall or narrower side, in the right part and hanging Margine. At the common meeting where the one number answereth directly to the other, there your true Square shall appeare. This square so found, shall bee referred to your Table of Timber measure: in the which you may plainly see (if you runne downe by the left Margine, vntill your Inches square appeare) how many Feete or Inches of your Ruler belong to a Foote square. As often as that measure there found, is contained in the Timber or Stone, so often and as many Feete square yee may conclude (without doubt) the piece of Timber or Stone to haue.

The Art of measuring

Ensamble.

Suppose this squared Timber or Stone a. b. c. d. were to be measured, the broader side a. b. 20. Inches, the narrower side b. c. 13. Inches, the length 40. Inches. Now I must seeke the broader side 20. in the upper Margine of the table. The narrower side 13. must bee found in the right side and hanging Margine. At their common meeting 16. Inches, and $\frac{1}{2}$. part of an Inch shall appeare.

This true Square must bee searched for in the table of timber measure. Therefoze looke for 16. in the Margine of this table. In the Squares with him rightward, ye shall finde 6. inches, and $\frac{3}{4}$. which is three quarters of an Inch. Some deale lesse of your Ruler than 6. and $\frac{3}{4}$. laid out vpon the timber, maketh a Foote Square. And that measure so directly handled, is contained in the Length of your Timber sixe times. Therefore affirme sixe Foote there to be, beside that is left $\frac{1}{2}$. part of a Foote. Note because the Squares at all times (in this Ensamble) rise not to euen Inches, but sometime to odde parts: therefore according to your discretion, adde or take away some part more or lesse in setting forth the Foote Square, as aboue is performed.



It were intolerable tediousnesse, yea impossible to set forth the true quantities of timber measure, to all odde Quantities of Squares. The discrete handling of these, the wittie shall bring to a sufficient exactnesse.

Of Timber or Stone, 3.5.10.20. or
more sides Square, &c.

The viij. Chapter.



When Timber hath diuers equall Squares in the head, and so through: first, measure all the square sides round about the head or end of the Timber. Then take halfe the number of the whole measure for one breadth.

Then measure from the Center (which is the middle of the head, or end of the Timber) to the middle of the Square side, betwene the two Angles, and take the measure of that distance for the other breadth. Now resort with the measures of these two breadths, (as before) to the Table of Squares: seeing the bigger number of breadth in the upper Margine, and the other lesser in the side Margine. With the square there found, haue recourse to the Table of Timber measure, and doe as I haue instructed.

Ensample.

Admit this small piece of Timber five square, e. f. g. h. should bee measured, euery side being 12. Inches. If ye adde together in one summe all the five sides, they make 60. Inches. The halfe is 30. that serueth for one breadth. Then the Line e. f. which goeth from the Center or middle of the Square, to the middle of one side, is 8. Inches. The two number 30. and 8. must be sought (as before) in the table of squares following. At the common meeting, your square shall appeare 15. Inches, & $\frac{1}{2}$. This square 15. seeke in the Table of Timber measure. There yee may see right with it 7. Inches, and $\frac{1}{2}$. Now because of $\frac{1}{2}$. the odde quantitie of the



D 2

Square

The Art of measuring

Square about 15. Inches, lay something lesse. When see how oftentimes that measure (so with discretion handled) is from the one end of your Timber to the other: and affirme so many times a Foote square there to be, as that measure is found in the length of your Logge.

How round and hollow Timber, Steeples,
Pillars, Globes, &c. are to be measured.

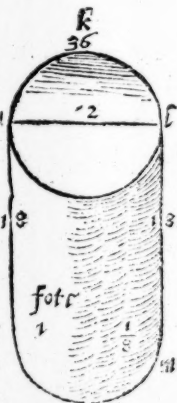
The ix. Chapter.



First gird the Logge round about with some Line: then diuide the Line which compasseth that timber in two equall parts: keepe the one part for the bigger breadth. After, ye shall diuide againe that whole length (the two and twenty part cast away) in three parts, and take the halfe of one of them for the other narrower breadth. With the measures of these two breadths, halfe to your table, performing all things as afoze is opened.

Ensample.

Suppose this little piece of Timber, i. k. l. m. were to be measured, the compasse or girding 36. Inches, and the halfe of that is 18. being the one breadth: then the third of 36. is 12. the halfe of it is 6. which is the other narrower breadth, with these two numbers 6. and 18. enter the Table of Squares following, and so the table of Timber measure. At the last (all things performed as before) yee shall finde in this round Logge, the length l. m. being 18. Inches, 1. Foote, and $\frac{1}{8}$ part of a Foote. This is sufficient for all such like.



A note of hollowed Timber

If it chance that hollowed Timber bee to bee measured: measure the whole Logge as though it were not hollow, as above is declared. Then measure the narrower and broader side of the hollow, and see what is contained in that, as though it were massie Timber. Now pull out the content of it, from the whole above measured: the remaine of force must shew what timber is included in that hollowed body.

IAm unable in few words to expresse to the vnlearned, by what meane Pyramidall, or picked regular Steeples of all fashions are measured. Also how Pillers, how the content of Globes or Bowles are searched, vnesse the Art of numbering were tasted. That being knowne: thus (as now followeth) I teach.

How the crassitude of picked Steeples is knowne.

Multiply the plaine of the Base in the third part of the Height: so pee haue the Crassitude. Or multiply the Content superficiall (found as I haue instructed) in the Height of the Steeple, taking for your purpose the third part of that product.

How the Content of Pillers is knowne.

Increase the Base plaine in his Altitude or Height: so haue ye your desire.

The Art of measuring

How the Cubicall bodies of Globes are searched.

The content Superficiall found, (as I haue opened) must be multiplied in the sixth part of the Diameter: the product is that yee require: Or the third part of the Superficiall Content in halfe the Diameter. Or multiply the plaine of the Circle in the whole Diameter: then take two third parts, which added, make the Crassitude.

Of the halfe Circle.

His Superficiall Content multiplied (as I said) bringeth the magnitude of him. If any man require ensamples of these last matters, or more sufficient handling: let them resort vnto my bookes published of Geometrie, where they shall be satisfied. These little appertaine to Carpenters or Masons: therefore not by ensample declared.

A generall note.

When thou shalt bee put to measure some Body, without order or fashion, lacking part of his Square, or hauing more than his Forme: if it lacke thou shalt make it perfect, by obseruing diligently the running together of the sides. The parts wanting shall bee measured, as though they were there, which portions must be taken from the whole Body measured.

Also when there resulteth any more than the forme of Regular Square: first measure the square Body: then the Crassitude which aboundeth. All put together, doe shew the whole irregular Body. This sufficeth.

A Table to finde the iust Radix or Square of any Timber or Stone.

Behoueth you to know, that this table following is made for the true square of any manner timber: therfore vnderstand that the numbers from 1. to 40. set aboue in the high Margine, betoken the Inches of the broader side of the timber. And the numbers from 1. and so downeward to 30. put in the right part and hanging Margine of this table, signifie the Inches of the narrower side: and to conclude briefly, the Element of figures set in euery square roome, betoken the iust square. The bigger figures leftward in euery square place, signifie the whole Inches. And the other lesser rightward in the same square diuided by a line, the parts of Inches, as $\frac{1}{2}$, &c.

This first Fraction toward the left hand, betokeneth one halfe part of an inch: the other two fiftes of an Inch, and euery figure of fraction hauing a point adioyned vnto him, some deale lesse than that part is: as that part, $\frac{1}{2}$ representeth scarce halfe an Inch, a very little quantitie lesse. And if it had two prickles by him, he should haue declared some quantitie more: as this other fraction of part, $\frac{2}{5}$: which is more than two fiftes, a small deale.

It had not bene needfull to haue put the parts of the Square so precisely as they are here: neither is it requisite so curiously to take them.

1	2
1	1 $\frac{3}{7}$
	2

The f

TABVLA RADICVM

[illegible]

The Table
of Squares

face this Table better D. and C.

TABVLA

RADIC

10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
3 $\frac{1}{2}$	3 $\frac{1}{3}$	3 $\frac{1}{4}$	3 $\frac{1}{5}$	3 $\frac{1}{6}$	3 $\frac{1}{7}$	3 $\frac{1}{8}$	4 $\frac{1}{8}$	4 $\frac{1}{4}$	4 $\frac{1}{2}$	4 $\frac{1}{3}$	4 $\frac{1}{4}$	4 $\frac{1}{5}$	4 $\frac{1}{6}$	5	5	5 $\frac{1}{10}$
4 $\frac{1}{2}$	4 $\frac{1}{3}$	5	5 $\frac{1}{10}$	5 $\frac{1}{4}$	5 $\frac{1}{5}$	5 $\frac{1}{8}$	6 $\frac{1}{8}$	6 $\frac{1}{4}$	6 $\frac{1}{2}$	6 $\frac{1}{3}$	6 $\frac{1}{4}$	6 $\frac{1}{5}$	7	7	7 $\frac{1}{10}$	7 $\frac{1}{5}$
5 $\frac{1}{2}$	5 $\frac{1}{3}$	6	6 $\frac{1}{4}$	6 $\frac{1}{5}$	6 $\frac{1}{6}$	7	7 $\frac{1}{8}$	7 $\frac{1}{4}$	7 $\frac{1}{2}$	7 $\frac{1}{3}$	8	8	8 $\frac{1}{10}$	8 $\frac{1}{5}$	9	9 $\frac{1}{10}$
6 $\frac{1}{2}$	6 $\frac{1}{3}$	7	7 $\frac{1}{5}$	7 $\frac{1}{4}$	7 $\frac{1}{6}$	8	8 $\frac{1}{8}$	8 $\frac{1}{4}$	9	9 $\frac{1}{2}$	9	9 $\frac{1}{4}$	9 $\frac{1}{5}$	10	10	10 $\frac{1}{10}$
7 $\frac{1}{2}$	7 $\frac{1}{3}$	7 $\frac{1}{4}$	8 $\frac{1}{10}$	8 $\frac{1}{5}$	8 $\frac{1}{6}$	9	9 $\frac{1}{8}$	9 $\frac{1}{4}$	10	10 $\frac{1}{2}$	10	10 $\frac{1}{4}$	11	11	11	11 $\frac{1}{10}$
7 $\frac{1}{4}$	8 $\frac{1}{3}$	8 $\frac{1}{2}$	9 $\frac{1}{6}$	9 $\frac{1}{5}$	9 $\frac{1}{4}$	10	10 $\frac{1}{8}$	10 $\frac{1}{4}$	11	11 $\frac{1}{2}$	11	11 $\frac{1}{4}$	12	12	12	12 $\frac{1}{10}$
8 $\frac{1}{2}$	8 $\frac{1}{3}$	9 $\frac{1}{4}$	9 $\frac{1}{5}$	10 $\frac{1}{10}$	10 $\frac{1}{5}$	10 $\frac{1}{6}$	11 $\frac{1}{8}$	11 $\frac{1}{4}$	12	12 $\frac{1}{2}$	12	12 $\frac{1}{4}$	13	13	13	13 $\frac{1}{10}$
9	9 $\frac{1}{3}$	10 $\frac{1}{4}$	10 $\frac{1}{5}$	11 $\frac{1}{10}$	11 $\frac{1}{5}$	11 $\frac{1}{6}$	12 $\frac{1}{8}$	12 $\frac{1}{4}$	13	13 $\frac{1}{2}$	13	13 $\frac{1}{4}$	14	14	14	14 $\frac{1}{10}$
10	10 $\frac{1}{2}$	11	11 $\frac{1}{5}$	12 $\frac{1}{4}$	12 $\frac{1}{6}$	13	13 $\frac{1}{8}$	13 $\frac{1}{4}$	14	14 $\frac{1}{2}$	14	14 $\frac{1}{4}$	15	15	15	15 $\frac{1}{10}$
	11	11 $\frac{1}{2}$	12	12 $\frac{1}{4}$	13	13 $\frac{1}{6}$	14	14 $\frac{1}{4}$	15	15 $\frac{1}{2}$	15	15 $\frac{1}{4}$	16	16	16	16 $\frac{1}{10}$
		12	12 $\frac{1}{2}$	13	13 $\frac{1}{5}$	14	14 $\frac{1}{6}$	15	15 $\frac{1}{4}$	16	16 $\frac{1}{2}$	16	16 $\frac{1}{4}$	17	17	17 $\frac{1}{10}$
			13	13 $\frac{1}{2}$	14	14 $\frac{1}{4}$	15	15 $\frac{1}{6}$	16	16 $\frac{1}{4}$	17	17 $\frac{1}{2}$	17	17 $\frac{1}{4}$	18	18 $\frac{1}{10}$
				14	14 $\frac{1}{2}$	15	15 $\frac{1}{4}$	16	16 $\frac{1}{6}$	17	17 $\frac{1}{4}$	18	18 $\frac{1}{5}$	19	19	19 $\frac{1}{10}$
					15	15 $\frac{1}{2}$	16	16 $\frac{1}{4}$	17	17 $\frac{1}{6}$	18	18 $\frac{1}{4}$	19	19 $\frac{1}{5}$	20	20 $\frac{1}{10}$
						16	16 $\frac{1}{2}$	17	17 $\frac{1}{4}$	18	18 $\frac{1}{6}$	19	19 $\frac{1}{4}$	20	20 $\frac{1}{5}$	21 $\frac{1}{10}$
							17	17 $\frac{1}{2}$	18	18 $\frac{1}{4}$	19	19 $\frac{1}{6}$	20	20 $\frac{1}{4}$	21	21 $\frac{1}{5}$
								18	18 $\frac{1}{2}$	19	19 $\frac{1}{4}$	20	20 $\frac{1}{6}$	21	21 $\frac{1}{4}$	22 $\frac{1}{10}$
									19	19 $\frac{1}{2}$	20	20 $\frac{1}{4}$	21	21 $\frac{1}{6}$	22	22 $\frac{1}{5}$
										20	20 $\frac{1}{2}$	21	21 $\frac{1}{4}$	22	22 $\frac{1}{6}$	23 $\frac{1}{10}$
											21	21 $\frac{1}{2}$	22	22 $\frac{1}{4}$	23	23 $\frac{1}{5}$
												22	22 $\frac{1}{2}$	23	23 $\frac{1}{6}$	24 $\frac{1}{10}$
													23	23 $\frac{1}{2}$	24	24 $\frac{1}{5}$
														24	24 $\frac{1}{4}$	25 $\frac{1}{10}$
															25	25 $\frac{1}{5}$
																26

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III
f

Facetis Tabla beatorum D. and E.

6 6 $\frac{1}{2}$ 7 7 $\frac{1}{3}$ 7 $\frac{1}{4}$ 8 $\frac{1}{5}$ 8 $\frac{1}{6}$ 9 $\frac{1}{7}$ 9 $\frac{1}{8}$ 10 $\frac{1}{9}$ 10 $\frac{1}{10}$ 11 $\frac{1}{11}$ 11 $\frac{1}{12}$ 12 $\frac{1}{13}$ 12 $\frac{1}{14}$ 13 $\frac{1}{15}$ 13 $\frac{1}{16}$ 14 $\frac{1}{17}$ 14 $\frac{1}{18}$ 15 $\frac{1}{19}$ 15 $\frac{1}{20}$ 16 $\frac{1}{21}$ 16 $\frac{1}{22}$ 17 $\frac{1}{23}$ 17 $\frac{1}{24}$ 18 $\frac{1}{25}$ 18 $\frac{1}{26}$ 19 $\frac{1}{27}$ 19 $\frac{1}{28}$ 20 $\frac{1}{29}$ 20 $\frac{1}{30}$ 21 $\frac{1}{31}$ 21 $\frac{1}{32}$ 22 $\frac{1}{33}$ 22 $\frac{1}{34}$ 23 $\frac{1}{35}$ 23 $\frac{1}{36}$ 24 $\frac{1}{37}$ 24 $\frac{1}{38}$ 25 $\frac{1}{39}$ 25 $\frac{1}{40}$ 26 $\frac{1}{41}$ 26 $\frac{1}{42}$ 27 $\frac{1}{43}$ 27 $\frac{1}{44}$ 28 $\frac{1}{45}$ 28 $\frac{1}{46}$ 29 $\frac{1}{47}$ 29 $\frac{1}{48}$ 30 $\frac{1}{49}$ 30 $\frac{1}{50}$ 31 $\frac{1}{51}$ 31 $\frac{1}{52}$ 32 $\frac{1}{53}$ 32 $\frac{1}{54}$ 33 $\frac{1}{55}$ 33 $\frac{1}{56}$ 34 $\frac{1}{57}$ 34 $\frac{1}{58}$ 35 $\frac{1}{59}$ 35 $\frac{1}{60}$ 36 $\frac{1}{61}$ 36 $\frac{1}{62}$ 37 $\frac{1}{63}$ 37 $\frac{1}{64}$ 38 $\frac{1}{65}$ 38 $\frac{1}{66}$ 39 $\frac{1}{67}$ 39 $\frac{1}{68}$ 40 $\frac{1}{69}$ 40 $\frac{1}{70}$ 41 $\frac{1}{71}$ 41 $\frac{1}{72}$ 42 $\frac{1}{73}$ 42 $\frac{1}{74}$ 43 $\frac{1}{75}$ 43 $\frac{1}{76}$ 44 $\frac{1}{77}$ 44 $\frac{1}{78}$ 45 $\frac{1}{79}$ 45 $\frac{1}{80}$ 46 $\frac{1}{81}$ 46 $\frac{1}{82}$ 47 $\frac{1}{83}$ 47 $\frac{1}{84}$ 48 $\frac{1}{85}$ 48 $\frac{1}{86}$ 49 $\frac{1}{87}$ 49 $\frac{1}{88}$ 50 $\frac{1}{89}$ 50 $\frac{1}{90}$ 51 $\frac{1}{91}$ 51 $\frac{1}{92}$ 52 $\frac{1}{93}$ 52 $\frac{1}{94}$ 53 $\frac{1}{95}$ 53 $\frac{1}{96}$ 54 $\frac{1}{97}$ 54 $\frac{1}{98}$ 55 $\frac{1}{99}$ 55 $\frac{1}{100}$

7	$\frac{2}{3}$	8	$\frac{1}{3}$	8	$\frac{1}{2}$	9	$\frac{5}{6}$	9	$\frac{1}{6}$	9	$\frac{1}{2}$	10	$\frac{2}{3}$	10	$\frac{1}{3}$	10	$\frac{1}{6}$	11	$\frac{1}{4}$	11	$\frac{1}{2}$	11	$\frac{1}{4}$	12	$\frac{1}{3}$
8	$\frac{3}{8}$	8	$\frac{2}{3}$	9	$\frac{1}{3}$	9	$\frac{2}{3}$	10	$\frac{1}{3}$	10	$\frac{1}{2}$	10	$\frac{1}{3}$	11	$\frac{1}{4}$	11	$\frac{1}{3}$	11	$\frac{1}{2}$	12	$\frac{1}{3}$	12	$\frac{1}{2}$	12	$\frac{1}{3}$
9	$\frac{1}{2}$	9	$\frac{1}{3}$	9	$\frac{1}{2}$	10	$\frac{1}{2}$	10	$\frac{1}{2}$	11	$\frac{1}{2}$	11	$\frac{1}{2}$	11	$\frac{1}{2}$	12	$\frac{1}{2}$	12	$\frac{1}{2}$	12	$\frac{1}{2}$	13	$\frac{1}{2}$	13	$\frac{1}{2}$
9	$\frac{1}{2}$	10	$\frac{2}{5}$	10	$\frac{2}{5}$	10	$\frac{2}{5}$	11	$\frac{1}{4}$	11	$\frac{1}{5}$	12	$\frac{3}{8}$	12	$\frac{3}{4}$	13	$\frac{2}{5}$	13	$\frac{2}{5}$	14	$\frac{1}{2}$	14	$\frac{1}{3}$	15	$\frac{1}{4}$
10	$\frac{1}{2}$	11	$\frac{1}{2}$	11	$\frac{2}{5}$	11	$\frac{2}{5}$	12	$\frac{1}{4}$	12	$\frac{1}{4}$	13	$\frac{1}{3}$	13	$\frac{1}{3}$	14	$\frac{1}{4}$	14	$\frac{1}{4}$	15	$\frac{1}{4}$	15	$\frac{1}{4}$	16	$\frac{1}{4}$
		11	$\frac{1}{2}$	12	$\frac{1}{2}$	12	$\frac{1}{2}$	13	$\frac{1}{4}$	13	$\frac{1}{4}$	14	$\frac{1}{3}$	14	$\frac{1}{3}$	15	$\frac{1}{4}$	15	$\frac{1}{4}$	16	$\frac{1}{4}$	16	$\frac{1}{4}$	17	$\frac{1}{4}$
		12	$\frac{1}{2}$	13	$\frac{1}{2}$	13	$\frac{1}{2}$	14	$\frac{1}{4}$	14	$\frac{1}{4}$	15	$\frac{1}{3}$	15	$\frac{1}{3}$	16	$\frac{1}{4}$	16	$\frac{1}{4}$	17	$\frac{1}{4}$	17	$\frac{1}{4}$	18	$\frac{1}{4}$
		13	$\frac{1}{2}$	14	$\frac{1}{2}$	14	$\frac{1}{2}$	15	$\frac{1}{4}$	15	$\frac{1}{4}$	16	$\frac{1}{3}$	16	$\frac{1}{3}$	17	$\frac{1}{4}$	17	$\frac{1}{4}$	18	$\frac{1}{4}$	18	$\frac{1}{4}$	19	$\frac{1}{4}$
		14	$\frac{1}{2}$	15	$\frac{1}{2}$	15	$\frac{1}{2}$	16	$\frac{1}{4}$	16	$\frac{1}{4}$	17	$\frac{1}{3}$	17	$\frac{1}{3}$	18	$\frac{1}{4}$	18	$\frac{1}{4}$	19	$\frac{1}{4}$	19	$\frac{1}{4}$	20	$\frac{1}{4}$
		15	$\frac{1}{2}$	16	$\frac{1}{2}$	16	$\frac{1}{2}$	17	$\frac{1}{4}$	17	$\frac{1}{4}$	18	$\frac{1}{3}$	18	$\frac{1}{3}$	19	$\frac{1}{4}$	19	$\frac{1}{4}$	20	$\frac{1}{4}$	20	$\frac{1}{4}$	21	$\frac{1}{4}$
		16	$\frac{1}{2}$	17	$\frac{1}{2}$	17	$\frac{1}{2}$	18	$\frac{1}{4}$	18	$\frac{1}{4}$	19	$\frac{1}{3}$	19	$\frac{1}{3}$	20	$\frac{1}{4}$	20	$\frac{1}{4}$	21	$\frac{1}{4}$	21	$\frac{1}{4}$	22	$\frac{1}{4}$
		17	$\frac{1}{2}$	18	$\frac{1}{2}$	18	$\frac{1}{2}$	19	$\frac{1}{4}$	19	$\frac{1}{4}$	20	$\frac{1}{3}$	20	$\frac{1}{3}$	21	$\frac{1}{4}$	21	$\frac{1}{4}$	22	$\frac{1}{4}$	22	$\frac{1}{4}$	23	$\frac{1}{4}$
		18	$\frac{1}{2}$	19	$\frac{1}{2}$	19	$\frac{1}{2}$	20	$\frac{1}{4}$	20	$\frac{1}{4}$	21	$\frac{1}{3}$	21	$\frac{1}{3}$	22	$\frac{1}{4}$	22	$\frac{1}{4}$	23	$\frac{1}{4}$	23	$\frac{1}{4}$	24	$\frac{1}{4}$
		19	$\frac{1}{2}$	20	$\frac{1}{2}$	20	$\frac{1}{2}$	21	$\frac{1}{4}$	21	$\frac{1}{4}$	22	$\frac{1}{3}$	22	$\frac{1}{3}$	23	$\frac{1}{4}$	23	$\frac{1}{4}$	24	$\frac{1}{4}$	24	$\frac{1}{4}$	25	$\frac{1}{4}$
		20	$\frac{1}{2}$	21	$\frac{1}{2}$	21	$\frac{1}{2}$	22	$\frac{1}{4}$	22	$\frac{1}{4}$	23	$\frac{1}{3}$	23	$\frac{1}{3}$	24	$\frac{1}{4}$	24	$\frac{1}{4}$	25	$\frac{1}{4}$	25	$\frac{1}{4}$	26	$\frac{1}{4}$
		21	$\frac{1}{2}$	22	$\frac{1}{2}$	22	$\frac{1}{2}$	23	$\frac{1}{4}$	23	$\frac{1}{4}$	24	$\frac{1}{3}$	24	$\frac{1}{3}$	25	$\frac{1}{4}$	25	$\frac{1}{4}$	26	$\frac{1}{4}$	26	$\frac{1}{4}$	27	$\frac{1}{4}$
		22	$\frac{1}{2}$	23	$\frac{1}{2}$	23	$\frac{1}{2}$	24	$\frac{1}{4}$	24	$\frac{1}{4}$	25	$\frac{1}{3}$	25	$\frac{1}{3}$	26	$\frac{1}{4}$	26	$\frac{1}{4}$	27	$\frac{1}{4}$	27	$\frac{1}{4}$	28	$\frac{1}{4}$
		23	$\frac{1}{2}$	24	$\frac{1}{2}$	24	$\frac{1}{2}$	25	$\frac{1}{4}$	25	$\frac{1}{4}$	26	$\frac{1}{3}$	26	$\frac{1}{3}$	27	$\frac{1}{4}$	27	$\frac{1}{4}$	28	$\frac{1}{4}$	28	$\frac{1}{4}$	29	$\frac{1}{4}$
		24	$\frac{1}{2}$	25	$\frac{1}{2}$	25	$\frac{1}{2}$	26	$\frac{1}{4}$	26	$\frac{1}{4}$	27	$\frac{1}{3}$	27	$\frac{1}{3}$	28	$\frac{1}{4}$	28	$\frac{1}{4}$	29	$\frac{1}{4}$	29	$\frac{1}{4}$	30	$\frac{1}{4}$
		25	$\frac{1}{2}$	26	$\frac{1}{2}$	26	$\frac{1}{2}$	27	$\frac{1}{4}$	27	$\frac{1}{4}$	28	$\frac{1}{3}$	28	$\frac{1}{3}$	29	$\frac{1}{4}$	29	$\frac{1}{4}$	30	$\frac{1}{4}$	30	$\frac{1}{4}$	31	$\frac{1}{4}$
		26	$\frac{1}{2}$	27	$\frac{1}{2}$	27	$\frac{1}{2}$	28	$\frac{1}{4}$	28	$\frac{1}{4}$	29	$\frac{1}{3}$	29	$\frac{1}{3}$	30	$\frac{1}{4}$	30	$\frac{1}{4}$	31	$\frac{1}{4}$	31	$\frac{1}{4}$	32	$\frac{1}{4}$
		27	$\frac{1}{2}$	28	$\frac{1}{2}$	28	$\frac{1}{2}$	29	$\frac{1}{4}$	29	$\frac{1}{4}$	30	$\frac{1}{3}$	30	$\frac{1}{3}$	31	$\frac{1}{4}$	31	$\frac{1}{4}$	32	$\frac{1}{4}$	32	$\frac{1}{4}$	33	$\frac{1}{4}$
		28	$\frac{1}{2}$	29	$\frac{1}{2}$	29	$\frac{1}{2}$	30	$\frac{1}{4}$	30	$\frac{1}{4}$	31	$\frac{1}{3}$	31	$\frac{1}{3}$	32	$\frac{1}{4}$	32	$\frac{1}{4}$	33	$\frac{1}{4}$	33	$\frac{1}{4}$	34	$\frac{1}{4}$
		29	$\frac{1}{2}$	30	$\frac{1}{2}$	30	$\frac{1}{2}$	31	$\frac{1}{4}$	31	$\frac{1}{4}$	32	$\frac{1}{3}$	32	$\frac{1}{3}$	33	$\frac{1}{4}$	33	$\frac{1}{4}$	34	$\frac{1}{4}$	34	$\frac{1}{4}$	35	$\frac{1}{4}$
		30	$\frac{1}{2}$	31	$\frac{1}{2}$	31	$\frac{1}{2}$	32	$\frac{1}{4}$	32	$\frac{1}{4}$	33	$\frac{1}{3}$	33	$\frac{1}{3}$	34	$\frac{1}{4}$	34	$\frac{1}{4}$	35	$\frac{1}{4}$	35	$\frac{1}{4}$	36	$\frac{1}{4}$
		31	$\frac{1}{2}$	32	$\frac{1}{2}$	32	$\frac{1}{2}$	33	$\frac{1}{4}$	33	$\frac{1}{4}$	34	$\frac{1}{3}$	34	$\frac{1}{3}$	35	$\frac{1}{4}$	35	$\frac{1}{4}$	36	$\frac{1}{4}$	36	$\frac{1}{4}$	37	$\frac{1}{4}$
		32	$\frac{1}{2}$	33	$\frac{1}{2}$	33	$\frac{1}{2}$	34	$\frac{1}{4}$	34	$\frac{1}{4}$	35	$\frac{1}{3}$	35	$\frac{1}{3}$	36	$\frac{1}{4}$	36	$\frac{1}{4}$	37	$\frac{1}{4}$	37	$\frac{1}{4}$	38	$\frac{1}{4}$
		33	$\frac{1}{2}$	34	$\frac{1}{2}$	34	$\frac{1}{2}$	35	$\frac{1}{4}$	35	$\frac{1}{4}$	36	$\frac{1}{3}$	36	$\frac{1}{3}$	37	$\frac{1}{4}$	37	$\frac{1}{4}$	38	$\frac{1}{4}$	38	$\frac{1}{4}$	39	$\frac{1}{4}$
		34	$\frac{1}{2}$	35	$\frac{1}{2}$	35	$\frac{1}{2}$	36	$\frac{1}{4}$	36	$\frac{1}{4}$	37	$\frac{1}{3}$	37	$\frac{1}{3}$	38	$\frac{1}{4}$	38	$\frac{1}{4}$	39	$\frac{1}{4}$	39	$\frac{1}{4}$	40	$\frac{1}{4}$
		35	$\frac{1}{2}$	36	$\frac{1}{2}$	36	$\frac{1}{2}$	37	$\frac{1}{4}$	37	$\frac{1}{4}$	38	$\frac{1}{3}$	38	$\frac{1}{3}$	39	$\frac{1}{4}$	39	$\frac{1}{4}$	40	$\frac{1}{4}$	40	$\frac{1}{4}$	41	$\frac{1}{4}$
		36	$\frac{1}{2}$	37	$\frac{1}{2}$	37	$\frac{1}{2}$	38	$\frac{1}{4}$	38	$\frac{1}{4}$	39	$\frac{1}{3}$	39	$\frac{1}{3}$	40	$\frac{1}{4}$	40	$\frac{1}{4}$	41	$\frac{1}{4}$	41	$\frac{1}{4}$	42	$\frac{1}{4}$
		37	$\frac{1}{2}$	38	$\frac{1}{2}$	38	$\frac{1}{2}$	39	$\frac{1}{4}$	39	$\frac{1}{4}$	40	$\frac{1}{3}$	40	$\frac{1}{3}$	41	$\frac{1}{4}$	41	$\frac{1}{4}$	42	$\frac{1}{4}$	42	$\frac{1}{4}$	43	$\frac{1}{4}$
		38	$\frac{1}{2}$	39	$\frac{1}{2}$	39	$\frac{1}{2}$	40	$\frac{1}{4}$	40	$\frac{1}{4}$	41	$\frac{1}{3}$	41	$\frac{1}{3}$	42	$\frac{1}{4}$	42	$\frac{1}{4}$	43	$\frac{1}{4}$	43	$\frac{1}{4}$	44	$\frac{1}{4}$
		39	$\frac{1}{2}$	40	$\frac{1}{2}$	40	$\frac{1}{2}$	41	$\frac{1}{4}$	41	$\frac{1}{4}$	42	$\frac{1}{3}$	42	$\frac{1}{3}$	43	$\frac{1}{4}$	43	$\frac{1}{4}$	44	$\frac{1}{4}$	44	$\frac{1}{4}$	45	$\frac{1}{4}$
		40	$\frac{1}{2}$	41	$\frac{1}{2}$	41	$\frac{1}{2}$	42	$\frac{1}{4}$	42	$\frac{1}{4}$	43	$\frac{1}{3}$	43	$\frac{1}{3}$	44	$\frac{1}{4}$	44	$\frac{1}{4}$	45	$\frac{1}{4}$	45	$\frac{1}{4}$	46	$\frac{1}{4}$
		41	$\frac{1}{2}$	42	$\frac{1}{2}$	42	$\frac{1}{2}$	43	$\frac{1}{4}$	43	$\frac{1}{4}$	44	$\frac{1}{3}$	44	$\frac{1}{3}$	45	$\frac{1}{4}$	45	$\frac{1}{4}$	46	$\frac{1}{4}$	46	$\frac{1}{4}$	47	$\frac{1}{4}$
		42	$\frac{1}{2}$	43	$\frac{1}{2}$	43	$\frac{1}{2}$	44	$\frac{1}{4}$	44	$\frac{1}{4}$	45	$\frac{1}{3}$	45	$\frac{1}{3}$	46	$\frac{1}{4}$	46	$\frac{1}{4}$	47	$\frac{1}{4}$	47	$\frac{1}{4}$	48	$\frac{1}{4}$
		43	$\frac{1}{2}$	44	$\frac{1}{2}$	44	$\frac{1}{2}$	45	$\frac{1}{4}$	45	$\frac{1}{4}$	46	$\frac{1}{3}$	46	$\frac{1}{3}$	47	$\frac{1}{4}$	47	$\frac{1}{4}$	48	$\frac{1}{4}$	48	$\frac{1}{4}$	49	$\frac{1}{4}$
		44	$\frac{1}{2}$	45	$\frac{1}{2}$	45	$\frac{1}{2}$	46	$\frac{1}{4}$	46	$\frac{1}{4}$	47	$\frac{1}{3}$	47	$\frac{1}{3}$	48	$\frac{1}{4}$	48	$\frac{1}{4}$	49	$\frac{1}{4}$	49	$\frac{1}{4}$	50	$\frac{1}{4}$
		45	$\frac{1}{2}$	46	$\frac{1}{2}$	46	$\frac{1}{2}$	47	$\frac{1}{4}$	47	$\frac{1}{4}$	48	$\frac{1}{3}$	48	$\frac{1}{3}$	49	$\frac{1}{4}$	49	$\frac{1}{4}$	50	$\frac{1}{4}$	50	$\frac{1}{4}$	51	$\frac{1}{4}$
		46	$\frac{1}{2}$	47	$\frac{1}{2}$	47	$\frac{1}{2}$	48	$\frac{1}{4}$	48	$\frac{1}{4}$	49	$\frac{1}{3}$	49	$\frac{1}{3}$	50	$\frac{1}{4}$	50	$\frac{1}{4}$	51	$\frac{1}{4}$	51	$\frac{1}{4}$	52	$\frac{1}{4}$
		47	$\frac{1}{2}$	48	$\frac{1}{2}$	48	$\frac{1}{2}$	49	$\frac{1}{4}$	49	$\frac{1}{4}$	50	$\frac{1}{3}$	50	$\frac{1}{3}$	51	$\frac{1}{4}$	51	$\frac{1}{4}$	52	$\frac{1}{4}$	52	$\frac{1}{4}$	53	$\frac{1}{4}$
		48	$\frac{1}{2}$	49	$\frac{1}{2}$	49	$\frac{1}{2}$	50	$\frac{1}{4}$	50	$\frac{1}{4}$	51	$\frac{1}{3}$	51	$\frac{1}{3}$	52	$\frac{1}{4}$	52	$\frac{1}{4}$	53	$\frac{1}{4}$	53	$\frac{1}{4}$	54	$\frac{1}{4}$
		49	$\frac{1}{2}$	50	$\frac{1}{2}$	50	$\frac{1}{2}$	51	$\frac{1}{4}$	51	$\frac{1}{4}$	52	$\frac{1}{3}$	52	$\frac{1}{3}$	53	$\frac{1}{4}$	53	$\frac{1}{4}$	54	$\frac{1}{4}$	54	$\frac{1}{4}$	55	$\frac{1}{4}$
		50	$\frac{1}{2}$	51	$\frac{1}{2}$	51	$\frac{1}{2}$	52	$\frac{1}{4}$	52	$\frac{1}{4}$	53	$\frac{1}{3}$	53	$\frac{1}{3}$	54	$\frac{1}{4}$	54	$\frac{1}{4}$	55	$\frac{1}{4}$	55	$\frac{1}{4}$	56	$\frac{1}{4}$
		51	$\frac{1}{2}$	52	$\frac{1}{2}$	52	$\frac{1}{2}$	53	$\frac{1}{4}$	53	$\frac{1}{4}$	54	$\frac{1}{3}$	54	$\frac{1}{3}$	55	$\frac{1}{4}$	55	$\frac{1}{4}$	56	$\frac{1}{4}$	56	$\frac{1}{4}$	57	$\frac{1}{4}$
		52	$\frac{1}{2}$	53	$\frac{1}{2}$	53	$\frac{1}{2}$	54	$\frac{1}{4}$	54	$\frac{1}{4}$	55	$\frac{1}{3}$	55	$\frac{1}{3}$	56	$\frac{1}{4}$	56	<						

Table II. Significant

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1911
1912

1911 1912 1913 1914 1915

The Table of Timber measure, with the declaration and vse of it.

15

The x. Chapter.

This Table (as pee see) is diuided into two Columnes of Rows: the one very short, the other longer. In the head of the first, I haue put this word Foot: in the second row, Inches, and parts to signifie Feet, Inches, and parts of Inches. The summes in the margine and left part of the first and second column, declare the quantitie of the square of Timber or Stone from 1. to 36. Inches square. Within the rows you may find the iust length to a foot square, if ye enter in to them in right order according to the square.

Example.

Suppose the square of your Timber were 7. Inches, and that pee desired to know what measure or length of the ruler would make a Foote square: seeke in the left margine, seuen Inches: and with him in that order toward the right hand, ye shall finde 2. foote 11. Inches, and $\frac{2}{3}$ of an Inch. Note because the fraction $\frac{2}{3}$ hath a prick by him, it betokeneth some small quantitie lesse then $\frac{2}{3}$ of an Inch. If it had two prickes of points thus: $\frac{2}{3}$ it should signifie some little quantitie more. Neither maketh it matter whether ye obserue this pricking or no, the quantitie is so little to bee added or pulled away.

Note what hath bene spoken of Timber, the same also is to bee vnderstood of Stone, likewise to bee measured.

Thus is finished the measuring of Timber.
Now ensuech of board.

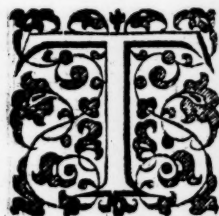
Foot		Inches		Parts	
1	144				
2	36				
3	16				
4	9				
5	9				
6	4				
7	2	11			
8	2	3			
9	0	21			
10	17				
11	14				
12	12				
13	10				
14	8				
15	7				
16	6				
17	6				
18	5				
19	4				
20	4				
21	3				
22	3				
23	3				
24	3				
25	2				
26	2				
27	2				
28	2				
29	2				
30	1				
31	1				
32	1				
33	1				
34	1				
35	1				
36	1				

How

Tables, Boord, or Glasse.

How Tables, Boords, Glasse, or any such like, are measured, according to their length and breadth, onely to the foot square.

The xi. Chapter.



This thing is performed by the helpe of a large Table following, diuided in sixe small Tables, and as many Margins. The first and left Margin beginneth at $\frac{1}{4}$. which is one quarter of an Inch, and extended to sixe Inches, as ye may plainly perceiue if ye runne downe by that Margin. This hath his Table on the right side adioyning vnto him. The other taketh his beginning at sixe Inches, $\frac{1}{4}$ and endeth at twelue, hauing his proper Table also. The third from 12. $\frac{1}{4}$ to 18. And so from 18. $\frac{1}{4}$ to 24: from 24 $\frac{1}{4}$ to 30. The last Margine is from 30. $\frac{1}{4}$ to 39. and there endeth.

Of this that is said, you may gather that euery Margin hath his Table on his right side. Also you must know that in the top, and beneath, I haue put (as in the Table of Timber measure) these words, Foot, Inch, and parts, to signifie, Feete, Inches, and parts of an Inch. Whensoever yee list to measure boord, Glasse, or any other such, with the breadth of it, enter this table, and seeke that breadth in his proper margin; there ye shall finde in right order how many Feet, Inches, or parts of an Inch, belong to a Foote square. So often as the measure is in your Ruffe, iust as many Feete haue ye in that Boord, or such like. If the breadth exceed this table, then diuide the breadth in parts, and worke as is and shall be declared. So the ingenious applyeth this Table for all manner breadths, most exactly.

Example.

Fo Y ₁₁				Fo Y ₁₁				Y ₁₁ Par				Yu Par				Yu Par				Yu Par					
1/4	48			0	1/4	1	1/25	12	1/4	1	3/4	18	1/4	7	7/8	14	1/4	5	15/16	30	1/4	4	1/4		
1/2	24			6	1/2	1	10/7	12	1/2	1	1/2	18	1/2	7	4/5	24	1/2	5	7/8	30	1/2	4	1/2		
3/4	16			6	3/4	1	2/3	12	3/4	1	2/7	18	3/4	7	3/4	24	3/4	5	4/5	30	3/4	4	3/4		
I	12			7	1	8	4/7	13	1	11	1/10	19	1	7	4/7	25	1	5	3/4	31	1	4	5/8		
1	1/4	9	7	1/5	7	1/4	1	7	7/3	13	1/4	10	7/8	19	1/4	7	1/2	25	1/4	5	2/3	31	1/4	4	5/8
1	1/2	8		1	1/2	1	7/5	13	1/2	10	1/3	19	1/2	7	2/3	25	1/2	5	5/8	31	1/2	4	4/5		
1	3/4	6	10	2/7	7	2/4	1	6	4/7	13	1/4	10	2/3	19	1/4	7	2/7	25	1/4	5	5/8	31	1/4	4	1/2
2	6			8	1	6		14	10	2/7	20	7	1/5	26	5	1/2			32	4	1/2				
2	1/4	5	4	8	1/4	1	5	3/7	14	1/4	10	3/4	7	1/3	26	1/4	5	1/2	32	1/4	4	1/2			
2	1/2	4	9	8	1/2	1	4	15/16	14	1/2	9	7/8	20	1/2	7	1/2	26	1/2	5	7/8	32	1/2	4	7/8	
2	3/4	4	4	8	3/4	1	4	2/5	14	3/4	9	3/4	20	3/4	6	15/16	26	3/4	5	3/8	32	3/4	4	8/9	
3	4			9	1	4		15	9	3/4	21	6	1/2	27	5	1/2			33	4	1/3				
3	1/4	3	8	1/3	9	1/4	1	3	4/7	15	1/4	9	3/7	21	1/4	6	4/5	27	1/4	5	2/3	33	1/4	4	1/3
3	1/2	3	5	1/2	9	1/2	1	3	1/7	15	1/2	9	2/7	21	1/2	6	5/7	27	1/2	5	2/3	33	1/2	4	2/3
3	3/4	3	2	2/5	9	2/4	1	2	3/4	15	3/4	9	3/8	21	3/4	6	5/8	27	3/4	5	3/4	33	3/4	4	4/5
4	3			10	1	2	2/5	16	7		22	6	1/2	28	5	1/3			34	4	1/4				
4	1/4	2	9	7/8	10	1/4	1	2	1/21	16	1/4	8	6/7	22	1/4	6	1/2	28	1/4	5	3/10	34	1/4	4	3/10
4	1/2	2	8		10	1/2	1	1	3/4	16	1/2	8	3/4	22	1/2	6	3/8	28	1/2	5	1/6	34	1/2	4	1/6
4	3/4	2	6	1/2	10	3/4	1	1	1/8	16	3/4	8	5/8	22	3/4	6	1/2	28	3/4	5	1/8	34	3/4	4	1/8
5	2	4	5		11	1	1/11	17	8	1/2	23	6	1/4	29	5				35	4	1/8				
5	1/4	2	3	3/7	11	1/4	1	4/5	17	1/8	3	1/2	23	1/4	6	1/5	29	1/4	4	7/8	35	1/4	4	3/20	
5	1/2	2	2	1/5	11	1/2	1	1/2	17	1/2	8	1/5	23	1/2	6	1/8	29	1/2	4	3/8	35	1/2	4	1/10	
5	3/4	2	1	2/3	11	3/4	1	2/7	17	3/4	8	3/22	23	3/4	6	1/10	29	3/4	4	5/6	35	3/4	4	1/12	
6	2			12	1			18	8		24	6		30	4	4/5			36	4					
Fo Y ₁₁				Fo Y ₁₁				Y ₁₁ Par				Yu Par				Yu Par				Yu Par					

The Art of measuring.

Ensample.

Suppose I haue a pane of Glasse, or a Boord, whose breadth were 22. inches, $\frac{1}{2}$. the length 16. foot. In the fourth machine, I finde this breadth, 22. and $\frac{1}{2}$. And euen with it in the table rightward, I see 6. inches, $\frac{1}{2}$. So much of my Ruler wanting some small quantity, maketh a foot.

Now because in the length of my boord (which is 16. foote) that measure is found 29. times, and $\frac{2}{3}$ parts: I conclude 29. foote there to be, and two third parts of a foote Square, according to the length and breadth I said (wanting some small quantity) because of the point ioyned to this fraction $\frac{2}{3}$. which is put to diminish the fraction some little thing, as is declared plainly in the other Tables before put forth.

He that desireth to measure chamber floozes, pauements, or such like, let him onely multiply the breadth with the length, so the product sheweth the Content.

Ensample.

If there were a pauement 100. foot long, and in breadth 50. I must needs conclude by multiplication of the length in the breadth there to be contained 5000. foot.

Or thus without Arithmeticke, when the breadth exceedeth the Table.

Divide the breadth in parts (as is opened in the Declaration of the table of account) and worke as I haue before instructed. So for pauements all manner of wayes it serueth your turne. Of this matter to put forth tables, were superfluous: tediousnesse and folly. The ingenious with these few will be satisfied.

The Carpenters Ruler.

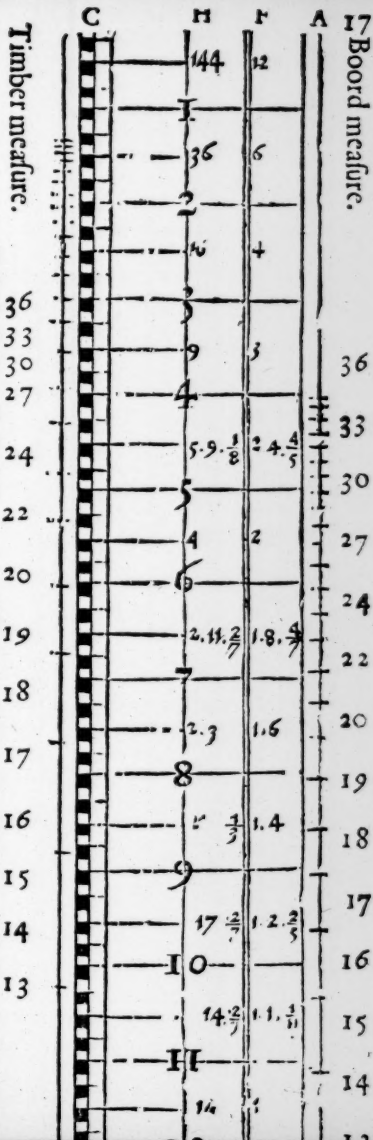
The face of the Carpenters
Ruler, figured with the
true measures, and other
things necessary.

The xij. Chapter.


BEcause the effect of this
Ruler is above declared by
tables, an instrument also well
knowne & common among good
Artificers, I will not spend
many words in opening it. Be-
hold the figures and learne by
them how yee ought to make and
commonly to decke your ruler,
both with timber and boord mea-
sure.

Ensample.

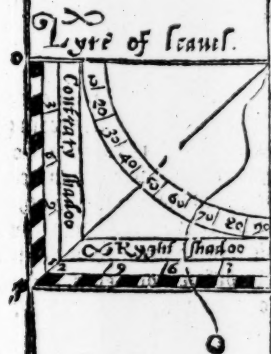
Admit the Ruler to bee a. b.
c. d. well plained 12. Inches
long, a quarter of an Inch
thick, and two Inches in breadth.
Truely it were moze commo-
dious, if it had two foote in
length. This ruler here ima-
gined, but a foote in length is
diuided first in 12. even parts
called inches: then every inch
in halfe of two equall por-
tions: each halfe in two quar-
ters: every quarter in fours of
2. parts at the least: as in this
ensample. Then are the figures
placed from 1. to 12. manife-
sting the Inches. Thus your
ruler is ready to receiue the mea-
sures which are marked or fi-
gured on your Ruler thus. Adde
first the timber measure as fol-



The Carpenters Ruler.


 shall resort to your table of Timber measure, and seeke how many feete belong to one Inch square: there yee shall finde 144. This number note, write, or rather graue, where this figure 1. representing one Inch, is figured as ye may see in the midst betwene the line e. f. and the line of the figure g. h. This done, resort to your table againe, and behold how many feete and parts two Inches square requireth. So shall yee finde 36. foote, which is placed in the next roome leftward, vnder the Character 2. signifying two Inches. Thus the rest, feete, Inches, and parts, found in your table, vntill you come to the 12. Inch, where yee shall perceiue twelue Inches onely to bee set in his proper roome, &c. Then seeke further in your table what belongeth to 13. Inches. Loe tenne Inches and $\frac{1}{2}$. This must bee numbred in the line c. d. from c. which line betokeneth the thickenesse of the Ruler. Make there a little strike vpon that grossenesse, euen or right against the measure 10. What neede many words? Thus doe vntill you come to 36. Inches, and that is noted (as the table of timber measure sheweth) right with one Inch and $\frac{1}{2}$ from c. No otherwise is performed of boord measure, as ye may behold set forth by the helpe of his proper table in the Square roomes beneath the line e. f. and also the other thickenesse of line b. a.

The backside
of the ruler.



This other figure i.k.l.m.
is the backside of your ruler,
hauing in the middelt of
Geometricall quadrant n. o.
p. q. whose making in few
words is thus exprested. The
line of breadth of your ruler
n.o. the line o.p.p.q.q.n. ought
to be of one equall inst length,
cutting each other squrewise.

And from the center n. unto
p. is drawne another line,
which is called the line of
height. So is o.n. the line of
leuell. q. n. the line of height
upright. This knowne, I open
my compasse, one foot remain-
ing. In the center n. the other
extended in the line of leuell
almost to o. making a circum-
ference to q.n. which is a por-
tion of a circle named a qua-
drant, and ought to be diuided
into 90. equal parts, as ye may
behold, euery of them called a
degree. Ye may diuide the
lines o.p.p.q. named the Scale
each in 12. as here, or in 60 yea
in 100. equal portions is more
meet for the vse of Shadowes,
heights, lengths, &c. Note that
the side of halfe Scale, o.p. is
called the contrary shadow p.
p. right shadow. Remember
that vpon the thickest m. k.

ye ought to haue two fine e-
quall square sights wel boied,
reprented here by r.s. made of
wood, or rather mettall to be

The making of
a Geon etricall
quadrant.

Note these
three principal
lines.

The diuided
sides o.p. and
p.q. are called
the Scale.

The Carpenters Ruler.

The common vse of the Carpenters Ruler,
touching the Face afore put forth.

The xiiij. Chapter.

The eight
Chap. sheweth
how the true
square is found.



Suppose a piece of timber to beemoaten, whose true square is 7. Inches, this square appointed you to the figure of 7. in the line g. h. vnder whom rightward in the place assigned to Timber measure is written 2. foot, 11. Inches, $\frac{7}{8}$. As often as that measure is found in the length of your timber, so many foots of timber is in that piece.

Another Ensamble.

Imagine your Square to bee 22. Inches: seeke in the line I a. c. Note then how much of your Ruler is left from that to the end of your Rule c. and so much belongeth to a Foote. Therefore lay out the measure vpon your timber, and reckon how many times yee may finde it, from the one to the other of your Logge: for so many foot of timber is there. Euen thus of boord. Seeke the bredth vpon your Ruler, in the roome or place of boord measure, and immediately before your eyes there remaineth what is to be laid out to make a iust foot of boord.

The vse of the principall lines in the Geometrical Quadrant on the back side of the Ruler, and first of the leuell line.

The xv. Chapter.



I behoueth you to looke through your sights q. n. placed in the thickenesse of line k. m. a fine thred and plummet falling at liberty out of the Center n. If this plummet and thred chaunce precisely on the line of leuell (which is n. o. whatsoeuer ye see through the sights, is leuell with your eye, if otherwise

wise the thing that yee looke vnto is not leuell, either more or lesse then the height or leuell of your eye: Howe, if the Plummert fall to you ward: lesse, if contrary.

How by the line of Leuell to forsee whether the water of any Spring or head is possible to be brought to a place appointed, and also to iudge the wholesomnesse of it.

The xvi. Chapter.



Ye shall goe to the head of Spring, and set your Ruler to your eye (being in height equall with the water) so that the fine cord and Plummert fall precisely in the line of leuell. Now if through the sights ye may see aboue the place, know and iudge the water possible to be brought: if your sight fall vnder, impossible. It cometh commonly to passe, when the place to the which yee would haue water conueyed, is of any great distance from the head, then Hilles, Valleys, and such like impediments, let the line visuall to haue his free course: wherefore this remedie is prouided. At the head of the spring, ye shall take thorow the sights (as before) and note a marke in the next Hill toward the place, then goe to the marke in like manner obserue another in some hill: so forth vntill by any of them yee may perceiue the place desired. If then your sight running through the pinnes of your Ruler (the third euer falling on the Line . . .) exceede that place, the conueying of your water is possible. Otherwise not.

Now by the way briefly yee shall bee instructed how yee may know the wholesomnesse of water.

How good water is knowne.

Take a cleane pot, and put water in it: so set it on the fire: after a little boyling, powze it out, if then no sith remaine

The vse of the Scale.

maine in the bottoime of the pot, it may bee iudged the whole-
somer. Or thus. Let fall drops vpon metall, or rather on
Glass (any of them being polished) and suffer that to drie by it
selfe: if after there remaine no spot or signe, it is a good token.
Pozeoner, if your water bee sweete, pure, cleare, light, or of
little weight, it followeth the water to bee whole some for the
vse of man.

Of the Line of height.

Whensoever the Thred and Plummet doe chaunce
iustly on the Height, which is n. p. the Altitude or
Height that yee see is euen with the distance from the middle
of your Foote, to the nether part directly vnder the toppe, e-
quall with your standing, adding the Height of your Eye
downeward. Know that yee must euer stand vpright with
Bodie and Necke, your Feete iust together, the one Eye
closed, &c.

The line of vpright Altitudes.

Iudge also any thing plumbe vpright when the thicknesse
of your Ruler i. l. is closely thereon, the plummet then at
Liberty falling on q. n. named the Line of heights vpright. Now
followeth the vse of the Scale.

To search out Heights by the Scale with the aide of two places.

The xviij. Chapter.

Et the Thred and Plummet fall in the one, on the
12. points: in the other Station, on the 6. of the
right shadow: double the distance betweene the
two places, the summittie appeareth from that part
of the thing measured, which is equall in Height with your
eye.

eye. Or the one in the 12. the other in 8. of right shadow: then triple the distance. The one in 12. the other in 6. of right Quadruplate, the space. The one in the 12. the other in 6. of the contrary shadow, then the space betweene both the Stations is equall with that yee measure, euer understanding from your eye vpward. Euen that same commeth to passe, if in the one the Thred bee found vpon the 6. of the contrarie, in the other on the 4. of the same, or the 4. and 3. of the contrarie. In all these the spaces are equall with the Altitudes. So then in measuring the distance betweene the two places, yee haue the height from your eye vpward, putting to it the length from your sight downward, the whole Altitude appeareth: the Base being equall with your standing.

I would not haue your ignorant here how to know lengths which be in height not easie to come vnto. For (as before) get the height of the toppes, the Altitude of the Base or longest part of your length. Subduct the lesse height out of the more, of force your desired length remaineth. Or thus: Let the plummet and thred fall in the 12. Marke your place: goe in toward the thing (the thred as it was) vntill yee see the Base of that length: the distance betweene the two standings, is vndoubtedly the Length.

How lengths
in height are
knowne.

How with Scale direct or vpright
heights by their shadowes are
declared.

The xix. Chapter.



Turne your left side vnto the Sunne, suffering his Beames to pearce both your sights q. r. placed (as afore is said) in the thicknesse or line k. m. The Thred or Plummet then hanging at liberty, out of the Center n. sheweth as well the Degrees

The vse of the

of height to bee counted from 0. as the parts of the Scale cut. If your thzed bee found in the 12. part of line of leuell, shadowes of all things being perpendicular eleuated, are equall with their bodies. If the plummet with the thzed bee perceiued, cutting the parts next to the sights, which I name points of the right shadow, then euery thing direct is more then his shadow, by that proportion which 12. exceedeth the parts, where the thzed was found. If it fall in 1. that is the first part of the right shadow, take the shadow twelue times, to make the height. In two, that is the second part, sixe times, in the third, foure times: in the fourth, thye times: in the fift, twice: and $\frac{1}{2}$. of the shadow, in the sixt twice, in the seuenth once, and $\frac{1}{2}$. in the eight once, and $\frac{1}{4}$: in the ninth once, and $\frac{1}{8}$: in the tenth once, and $\frac{1}{16}$: in the eleuenth ye shall take the shadow once, and $\frac{1}{16}$. part of it.

Right shadow.

If the Art of numbring were had, I would will you to multiply the length of the shadow by 12. and the product diuise by the parts, in the which ye found the thzed.

Contrary shadow.

But if it bee in the parts of the contrary shadow, augment the length of the shadow with the parts declared by the plummet: and the increase diuise them by 12. so cometh the Altitude also.

Thus the composition and whole appliance of the Carpenters Ruier is shewed: therefore somewhat shall be now said of the Squire.

I am not ignorant that the common vse of him, is better knowne than I can with many words expresse, wherefore I leaue to write in that behalfe. Notwithstanding I will declare how Heighes and Lengths are taken, &c. matters rare and knowne of few Artificers.

Also by Tables to get a true knowledge of the day houre, and that diuerse wayes, with the helpe of the Squire, as is opened in my generall Prognostication, augmented in the yeere of our Lord 1556.

Carpenters Squire.

21

What length the sides of thy Squire ought to bee, and the diuision of him.

The xx. Chapter.

I Neede not to put forth the exact making of this Instrument so well knowne. Lo therefore the figure. One side supposed two foote from the inward Angle: and the other a iust foote from the same. The longer a. b. inwardly diuided from the Angle a. vnto b. into 24. equall principall parts, and euery of them into a lesse (if ye list) each containing 10. minutes, also the side c. d. in the outward contrary, plaine from the top c. vnto d. is diuided into 12. euen portions: and againe (if yee require exactnesse)



euery of them into 6. each of value 10. minutes: Behold a line and plummet falling from c. to f. a Parallell to c. d. and a. b. Thus this Squire is well framed for the vse of siners Tables put forth in my generall Prognostication, and also for the finding of Altitudes and Longitudes, which here I purpose now briefly to open.

How by the Squire heights are knowne.

Altitudes or heights are found, the line or plummet centered in the sixt point, cutting b. the middle of a. g. The moueable

The vse of the

moueable sights placed in a. g. or a parallell from that line not unlike, as is opened of the line of height, in the backe of my Ruler.

How Lengths in plaine Ground are searched by the Carpenters or Ma- sons Squire.

The xxi. Chapter.

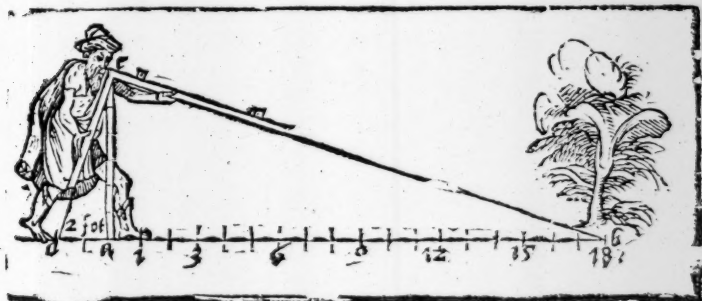
TAke a Staffe diuided into certaine portions as yee list, in a 100. or a 1000. parts. At the beginning of your length, vpon the very toppe directly standing, let the inward Angle of the Squire: lift vp or put downe this instrument, vntill you see the furthest part of your Longitude, I meane vntill your sight running from that Angle, to the end of your Squire, come vnto the furthest part of that length. The Squire so remaining, and the Staffe not remooued from his height. Marke where the other end of the Squire next vnto you noted vpon the ground. See what proportion the Staffe then beareth to the part of the ground, which the nearest end of the Squire pointed vnto from the Staffe: the same shall the Length haue to the quantitie of the same Staffe.

Ensample.

The cause is
taken out of
Euclid. 33. pro.
1. Booke and
the 4. pro. 6.
booke.

THe Staffe a. c. in this figure is imagined 6. Foot, and the space a. d. 2. Foot. Considering now that 6. the length of the Staffe containeth 2. thrice, therefore the Longitude desired, a. b. of force must containe thre times the Staffe (which Staffe is 6. Foote) that maketh 18. Foote. As this is prooued true by a small ground in the figure following: so the Art faileth not in a greater space, which the good Speculator?

Speculator and diligent Practiser by any way cannot denie. Yet experience willethe me this to confesse, that the Squire is not conuenient for any long distance, but the Instrument Geometricall (whose making and vse yee may perceine in the Treatise following) vnlesse yee ascend some Tree or Turret for your ayde, which length knowne, shall stand in stead of your Staffe.



A Note.

It behooueth you to haue a fine cord, made fast in the upper part of your Staffe. c. which shall bee tyed euen with the inward edge of the Squire, and so drawne to the ground, where the neere end of the Squire from the Staffe pointed, as ye see, d. c. the other end then truly directing to the furthest distance.

Know that the ground must be very plaine and leuell, otherwise error ensueth.

Thus the vse of the Squire is heere somewhat declared, but more in my generall Prognostication, yea most plentifully hereafter (God sparing life) in a Booke titled, The rare vse of the Squire in practises Mathematicall. In the which Booke profitable pleasant experiences shall bee plainly opened (onely of me practised) as well of Perspective, as of the Mathematicals in generall.



A little Treatise, declaring the making and vse of an Instrument Geometricall, so farre as it furthereth the Landmeater or Carpenter, named the profitable Staffe.

To the Reader.



Said in the beginning, that no little Booke would containe the making and manifold fruites of this princely Instrument, if it were set forth as it ought to bee in his perfection. Certes the trueth even here maketh me confesse the same: yea that there is no Instrument so generall and profitably pleasant: Notwithstanding know (gentle Reader) that the occasion of his chiefe vse and profit is not heere ministred: neither, to say the trueth, doth it appertaine to, or agree with the capacitie of such Artificers. Therefore I shall leaue to intreate of his ample large vse and best making, and will set him forth in few words: yea sufficiently for the Land-meaters capacitie or Carpenters purpose, that at the least, they may receiue some kinde of fruite with the Geometrer. And in time to come (by other meanes) as I see cause, I will largely declare, and there decke him with his proper beauties. Here now followeth the making, and so briefly, how he is applied for the profit of the aforesaid Artificers.

The vse of the profitable Staffe. 23

The making of this profitable Rodde or Staffe.

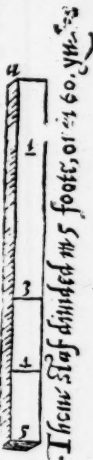


Ye shall prepare two small, streight, stiffe, round, or rather square rods of mettall or of wood, well plained of like bignesse and length. Although it make no matter of what length, yet to auoide the errours, which little instruments, and short stauces bring, and also to beare with the rude unwonted handling of such Artificers: let our Rods bee each five, or at the least three foote, and euery foote diuided in 12. euen parts of inches, as yee see a. b. and c. d. These Rods must bee forged with a voyce in the end of them to toyne readily tenne or sixe foote in length. (when time requirerth) as the figure e. f. sheweth. Also yee must get (by the helpe of some Craftiman) foure other like Rods, the longer g. 2. Foote: the next h. 1. Foote: the other i. 6. Inches, then k. 3. Inches, the last and shortest l. 1. Inch, and $\frac{1}{2}$. Each of these must haue in their middest a hole, that the long staffe of ten foote may bee put through them, and they moued on him at pleasure by and downe, alwayes cutting the longer staffe e. f. Squirewise, and made to carry on any diuision,

3. Inches.



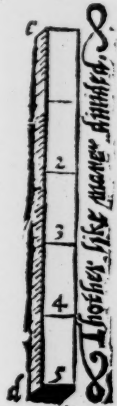
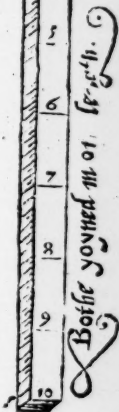
1. Foote.



6. Inches.



2. Foote in length.



The vse of the

as occasion shall be giuen: which all are easily to bee perceiued by the figure following, although my rude declaration hath not expressed my meaning.

Here note in the stead of your short staues, yee may haue one crosse staffe two foote long, with currant sights, so artificially made, that alwayes the short staffe shall runne squire vpon the longer, and the sights distant, as ye list to place them.

Things needfull to be knowne before the vse
of this Instrument is opened.

The ij. Chapter.

BEfore I intreate of this vse, it behoueth to know things necessary, and first which of the fve little staues g. h. i. k. l. mentioned in the making is to bee put vpon your long staffe e. f. according to the distance of the marke. Note if your marke be neere hand, be it length, breadth, or heighth, the longer g. doth seeme meetest to haue the roome, if moze of length, the other h. and so the further distance, the shorter the staffe requireth to be, which shall occupie that place. Ofte practise sheweth this better than many words. Also note, if chance bee to goe in toward your marke, (as after ye shall see how) you must remoue the short staffe inward moze neere to the end of the longer e. If ye bee compelled to goe from it, then put it from e. toward the end f. Also remember when ye are appointed to measure any breadth or length (as shall be declared) it behoueth you to stand right with, and against that breadth: yea, and the longer the breadth or larger the widenesse or length is, the better the thing will com to passe. And for heights it is necessary (if yee regard all precisenesse) to haue the height stand directly by.

Note this that followeth to be generall
in all workings.

YE must stand right by with your Bodie and Necke, your feete iust together, your hands not much mouing, the one eye

eye closed, and euer marke your standing right with the midst of your feete. Bee not ignorant here, that I call the extremes of the little stauces, the very ends where the sight euer runneth. And no difference betweene the Altitude and height, betweene the Longitude and length: the Latitude and breadth. The short stauces I name by the letter figured ouer them. Your eye must euer bee placed in the end of the longer staffe c. and with the other eye ye ought to winke.

What these words mean,
Longitude,
Latitude,
Altitude

These trifles and such like omitted, letteth the trueth to come to passe, and make men to suspect the Ground, which is most certaine.

How heights standing directly vp, are
measured by the instrument.

The ij. Chapter.

Put the staffe g. vpon the longer c. f. and moue him his iust length from the beginning of the longer c. turne the ends of g. toward you, and according to the height placing your eye (as is said) euer at the beginning of the longer c. With the other eye winke. Then go backe vntill ye may plainly perceiue the very vpper part of that Altitude, and also the lower end by the extremes of your shorter staffe g. Now the space of the midst of your foote to the base of the height is equall with the Altitude.

Or thus.

When ye shall see any Altitude, whose measure yee require, imagine by coniecture how oftentimes that height is found in the space from it vnto your standing. Then mooue your shorter staffe (chosen as aboue most conuenient) euen as often his owne length from the beginning of the longer c.

The vse of the

where your eye is euer placed. This done, turne the ends of your little stasse, your eye being in *e*. according to the height: looke whether pee may see by the extremes of your Hoxtter the very top, and also the lowest part of the height. If not, moue the Hoxtter a length further toward *f*. or neere to *e*. as pee see cause, and as your coniecture failed. Or let your little stasse remaine, as by coniecture hee was put, and goe toward or from that height, untill the Altitude agree iustly with the extremes of your Hoxt stasse. Then marke that place with the middlest of your foote.

Now ye may conclude, that the height is as often contained in the distance, which is betweene the marke and it, as the length of that little stasse is found remooued from the end of the longer, &c.

Ensample.

How the iust
height is
knowne.

If the Hoxt stasse bee tenne times his owne length from *e*. affirme the height contained in that distance ten times only.

A remedie pro-
vided for want
of ground.

The Altitude is thus gotten. Mooue your Hoxt stasse from his late being a length either toward or from *e*. as pee list to goe in or backe. Then goe fro or neere vnto it (as before) vntill the very summitie, and also the lowest part of the height agree with the extremes of your Hoxtter stasse. The space then betweene your marked place and this latter, declarcth the iust height. Oftentimes through impediments, pee shall not haue roome to goe so farre backe or forward, as the height commeth vn'o. This remedie is prouided. Mooue the kittle stasse halfe his length, and so seeke two stations (as before) untill the extreme of the Hoxtter stasse bee found iustly to answer either end of the height. Then the space betweene the two standings must bee doubled to haue the iust height: or if ye list, pee may moue the Hoxtter, according to the fourth part of his length, or to any portion, as to the fift, sixt, twenty, &c. then shall pee haue that part of the height betweene the two stations.

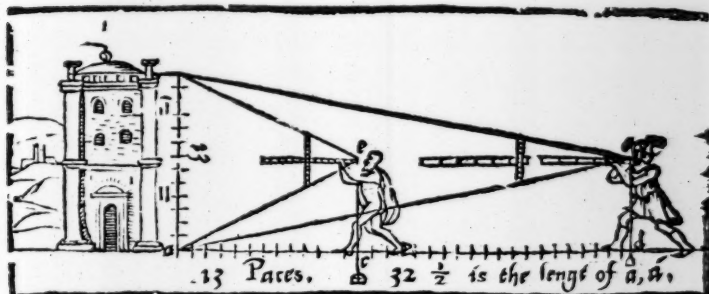
Rec

Yet know this (which experience by diligent practise will shew) the bigger parts yee take, the lesse error yee commit. A little error often multiplied, encreaseth to a great.

Now that all the aforespoken may the better bee perceived, behold the example ensuing, as yee may see by figure declared, in the which the height is imagined a.b. the first station c. the short staffe g. is moved from c. till his length h. I am forced to conclude, that the Base of the height a.b. is from my standing c. even his precise length. So then if you measure that distance of a.c. being 13. paces, yee have the true height of a.b. as many. In the other standing place e. the shortest staffe is found from e. twice his length and a halfe, wherefoze I must affirme the height a.b. to be contained or found in the distance a.d. twice and a halfe: which length a.d. is apparent 32. paces. All this that is spoken of the height, may well bee understood of Latitudes or widenesses, and lengths following.

The ground of this may be gathered of Euclide in his perspective, 21. Theo.

In Altitudes this rule is not perfect, except the eye be leuell with the middle of the Altitude.



The vse of the

How the breadth or widenesse of things
are found, and by them, Length or any
distance at pleasure.

The iij. Chapter.

Whatsoever I haue instructed afoze of heights, the same vnderstand here of widenesse, lengths, &c. For none otherwise are Latitudes or widenesses searched by this Instrument, then before is declared of heights, onely this excepted, that the short staffe must lie contrary, the ends according to the breadth, seeing by the extremes of the short staffe, the very vitermost parts or ends of the Latitude, noting your stations right with the midst of your foote. And so performe all as tofoze. And as I said, thereof the parts of the height found betweene your standings, euen the same things is well vled here, for all manner parts of the breadth.

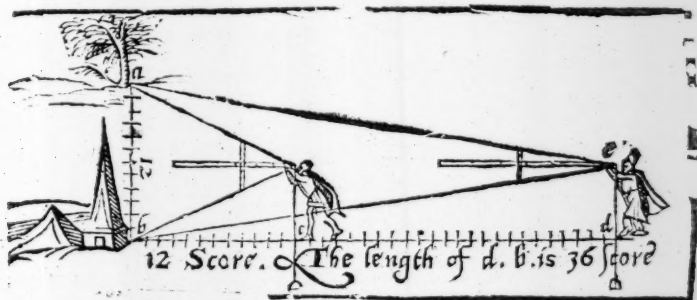
Ensample.

The breadth in this figure following supposed a. b. Also the first statton c. the next d. My desire is to know the widenesse a. b. and the length or distance d. b. Marke how the ends of the lesser stauces are turned to the extremes of the widenesse. Then behold how the short staffe in c. is but once his length remooued from c. Wherefore (by the instructions of heights afoze) ye may boldly say, that the widenesse a. b. is but once contained betweene d. and b. and that measure is found 12. scope, as much as is the other a. b. In the second standing d. the little staffe is remooued three times his length from c. For that cause I conclide (and truely) from b. to that station three times the breadth, which breadth is 12. scope. So by the widenesse I haue found the length of b. d. 36. scope, my desire. Thus are Latitudes found, and by them lengths, &c.

Behold

Behold the figure.

Ye must alwayes stand directly against the middle of the Breadth.



Whensoever any distance is put, whose certaine length yee require: measure (by the art exprested) either the height of any thing there found, or the breadth, and see how oftentimes that widenesse or length is contained unto your standing: which knowne, the length cannot be hid, as is declared.

NOW in few words to conclude, yee may by this Instrument measure the distance of Houses, Steeples, Trees, the length of Walles, the breadth of Ditches, Images in height, and such like. The good wittie Carpenter standing in a place, where hee may plainly see a whole house, or any manner frame with great pleasure, may by this get speedily the true proportion of that house, which hee ought to note in a Table, and when time commeth (not without his great praise) may make, reare and set up the like. This I take to be sufficient for these Craftsmen.

Amore larger
use of this In-
strument.

I haue

The vse of the, &c.

How the
length of land
is exactly
found.

I haue before forgotten to admonish you whensoever yee list to measure any land exactly, by the Instrument Geometricall, named the profitable Staffe, to set vp right a Rodde, the length of a Peache. Or if the distance be long, to passe out, or rather iustly mete five or moe Peaches, at the end of head of your length, the extremes noted with two visible markes. Then goe from thence, and seeke the lengths by that certaine widenesse, as is declared: so shall yee not faile to bring very true land. Note that a little errour found on the breadth, oft multiplied, encrease to a great, yea, to an intollerable fault in the length, therefore the breadth or widenesse ought truly to be searched. This I take sufficient for these Craftsmen.

I would desire where my grosse writings seeme to bee obscure, that I were present the Instructor: for truly a lively voyce of a meane speculator somewhat practised, furthereth tenne fold more in my iudgement, than the finest writer.

Farewell. Accept my good will, and looke shortly
(if God spare life) for a profitable encrease
of these matters.

FINIS.

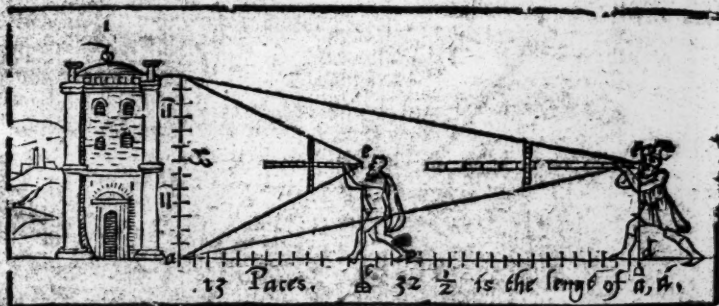
the surveyor of Boulton

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A
BOOKE NAMED
TECTONICON,

Briefly shewing the exact measuring, and speedie reckoning all manner of Land, Squares, Timber, Stone, Steeples, Pillers, Globes, &c. Further, declaring the perfect making and large use of the Carpenters Ruler, containing a Quadrant Geometrical: comprehending also the rare use of the Squire. And in the end a little Treatise adioyning, opening the composition and applanicy of an Instrument called the Profitable Staffe. With other things pleasant and necessary, most conduible for Surveyers, Land-meeters, Joynters, Carpenters and Masons.

Published by LEONARD DIGGES Gentleman, in
the yeere of our Lord, 1556.



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1634.

1596: 16-

1035
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London



L.D. To the Reader.



Although (gentle Reader) many excellent in Geometry, upon infallible grounds, haue put forth diuers most certaine and sufficient Rules, touching the measuring of all manner Superficies: yet in that the Art of numbring hath bene required, yea chiefly those Rules hid, and as it were locked vp in strangs Tongues, they doe profit (or haue furthered) very little the most part: Certes nothing at all, the Land-meater, Carpenter, Mason, wanting the aforesaid. For their sakes I am here prouoked not to hide, but to open, and so encrease the Talent which I haue receiued: yea, to publish in this our Tongue very shortly (if God giue life) a volume containing the flowers of the Sciences Mathematicall, largely applied to our outward practise, profitably pleasant to all manner men in this Realme. In the meane time I shall desire the Artificers aboue named, to bee contented with this little Booke (a taste of my good will towards them) which I wish euen so to further the Readers, as I know it sufficient for the true measuring and ready account of all manner Land, Timber, Stone, Boord, Glasse, Pansment, &c.

Here mine aduice shall bee to these Artificers that will profit in this, or any of my bookes now published, or that hereafter shall be, first carefully to reade them thorow, then with more iudgement. Reade at the third reading, wittily to practise: So few things shall be unknowne. Note, oft diligent reading, ioyned with ingenious practise, causeth profitable labour.

Thus most heartily farewell (loving Reader) to whom I wish
my selfe present, to further my desire and
practise in these.

THE PLEASANT PROFIT OR

content of this little Booke, and in what it

exceeds all other published.



Ther Bookes tofore put forth in our English tongue, contained onely the bare measuring of Land, Timber, and Boord: how agreeable in all places to the rules of Geometrie, let the learned iudge. Here (gentle Reader) thou shalt plainly perceiue through diligent reading, how to measure truly, and very speedily all manner of Land, Timber, Stone, Steeples, Pillers, Globes, Boord, Glasse, Pauement, &c. without any trouble: nor painted with many rules, or obscure termes, nor yet with the multitude of Tables, as heretofore hath bin: in which not a few errors were committed: for that cause no iust account might any way bee had. Further, ye shall by this Booke vnderstand the whole making and comely handling of the Carpenters Ruler, with the true measure, &c. And his vse appointed to the ready measuring of all kinde of Timber, Stone, Boord, &c. Also the leuelling of grounds, and taking of heights, is pleasantly and diuersly practised by the Ruler. Yee haue here not the common, but the rare vse of the Square, applied to heights, lengths, &c. And to the finding of the iust houre of the day diuers wayes, through the aide of pleasant Tables newly adioyned to my generall Prognostication: by the which the proportion of things, direct or squirewise standing, are by their shadowes knowne.

To conclude, in the end of this Booke is added a Treatise, shewing the making, and vse of an Instrument, by which yee shall get lengths, heights, breadths, widenesses, where

or howsoeuer they stand. Other necessary things

are contained in this little volume, which I

commit to the diligent
Reader.

The Art of

this manner $\frac{1}{2}$. Three quarters of an inch thus $\frac{3}{4}$. One eight of a Pearch, on this wise $\frac{1}{8}$. So of the rest.

It is requisite also heere to open what a Pearch, a Day worke, a Roode, and an Acre is.

Although there are diuers opinions engendred through long custome in many places, of the length of a Pearch (vpon which our chiefe matter dependeth) yet there is but one true Pearch by Statute appointed to measure by. Wherin is ordained three Verly coynes dry and round, to make an Inch: twelue inches, a Foot: three Foote a Yard: siue Yards, $\frac{1}{2}$. a Pearch: fortye Pearches in length, and foure in breadth, an Acre. So an Acre by Statute ought to containe 160. Pearches; the halfe Acre 80. Pearches; a Roode, commonly called a quarter, 40. Pearches, a Day worke 4. Pearches. Loe heere the Acre expressed with his length and breadth.

Acre.		Length.
1	160	
2	80	
4	40	
5	32	
8	20	
10	16	Breadth.

Instruments to
measure with
Poales,
Cord knotted,
Profitable
Staffe.

I must not omit heere to tell you what thing is meetest to measure Land with. They vse commonly in the countrey two Poales, either of them the length of a Pearch. They are very good: yet for all kinde of Land, a Cord siue Pearches in length, well seared with ware and rosen, knotted or marked at the end of euery Pearch, is moze meete and readier. But in my fantasie, the instrument Geometrical, which is put forth in the end of this Booke, passeth them all and other, for the exact truth and quickest speed. This Instrument is so generall and auailable to so sundry things, that it alone requireth a large Booke, if it should be sufficiently set forth.

Triangle.

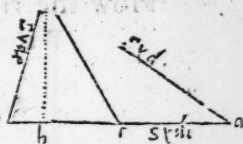
Line falling
Squirewise.

Also I would not haue you ignorant what piece of Land is called a Triangle, which often shall hereafter bee named. It is such a fashioned piece as hath (or is imagined to haue) three sides, and three Angles onely: whether the sides bee equall or otherwise, as this figure sheweth. Againe, note that a line is said to fall Squirewise, when it cutteth any thing, or any of a Triangle full crosse, like vnto a Squire: As the hanging pycked

measuring of Land.

2

picked line a. b. in c. d. the base line of the Triangle. Let it cutteth the side squirewise, or full crosse in the point b. and not as the other line a. c. doth. The base of any Triangle is here called that side, which is cut squirewise of the hanging line.



Base line.

Concerning a Circle, know, that the compass of any Circle is named a Circumference: the middle point therein, his Center: the right line h. i. that goeth over where that Center touching the Circumference on both sides is his Diameter: the halfe of that line, the Semidiameter. Also an Arch is a piece of the Circumference cut away: as yee see the Arch about the line f. g. Also f. g. h. i. in this Circle are named paralels: for that they differ equally in all places, the one from the other.



Circle.
Circumference.
Center.

Diameter.
Semidiameter.

Arch.

Paralels.

Note because practise and experience sheweth me, that there is almost no Land, but it may easily be brought by imagination to a Triangle or Triangles, and so most truly measured: therefore, to be short, this order shall be taken: I will first figure and set afoze your eyes Triangled Land, and other which by imaginations shall be brought into Triangles. Then I shall teach the true measuring of them: I meane, how to finde a length and breadth, with which yee shall enter the table of account following, where the Acres and odd Peaces (if there bee any) shall appeare. As these figures are measured, so all Triangled Land, and other brought into Triangles, of what fashion so ever they be, shall be measured. And because it is requisite for true measuring of all Triangles, to finde a straight hanging line, I shall shew first how that line is to be found, imagined, or drawne.

How

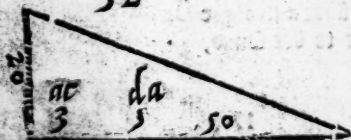
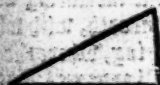
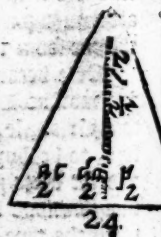
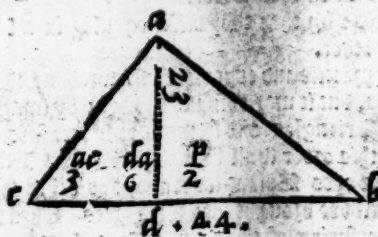
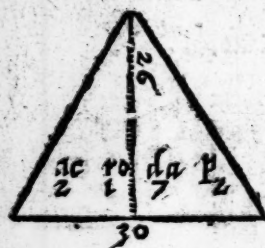
The Art of

How the right hanging line in Triangles is drawne.

The ij. Chapter.

To draw a
hanging or
plumbe line.

This straight hanging line in all Triangles is ever drawne or imagined from any Angle, cutting some one side of that Triangle squirewise: as yee may perceiue the picked lines in the Triangles following. By the helpe of this line, all Lands of Triangle fashion, are brought to be measured as ensueth.



How

How to measure all manner Triangled Land.

The iij. Chapter.

If thou bee an Arithmetician, multiply this Euclid. the 1. Bookc 41. pro. straight hanging line, drawne, as aboue is shewed, in halfe the number of Pearches of that side, which it cutteth Squirewise. For want of the knowledge, take the afozenamed Pearches (I meane of the hanging line, and halfe the side which he cutteth) and with that length and breadth enter your table of account, as there is set forth. So shall ye perceiue the number of Acres, Roods, Dayworkes, &c.

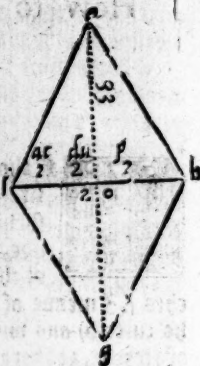
Example.

For the perfect measuring of Triangles afore figured, and all other, suppose the second of these last nine figures of the other side, hauing written aboue it a. b. c. d. to bee a peece of land, whereof I would haue the true measure, I finde by a Corde, otherwise, the pricked hanging line a. b. to bee 23. Pearches: the side b. c. which it cutteth squirewise 44. Pearches, whose halfe is 22. With these 22. and 23. the convenient length and breadth, I enter the table of account. Where I finde by that Table at the corner where both the lines of conuenient length and breadth doe meete 3. Acres, 6. day workes, and two pearches to be in that Triangle. Thus of all be fore figured.

Here note your Table must euer bee entered with all the Pearches of the hanging line, and with halfe the side that hee cutteth squirewise. Or with the halfe hanging line, and the whole side cut. This Table followeth.

A figure of a double Triangle.

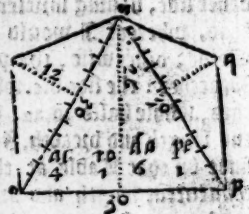
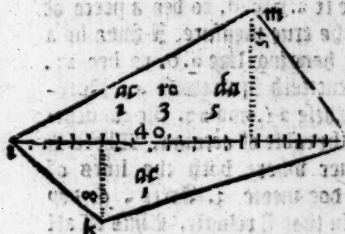
This figure e.f.g.h. is but two Triangles: and therefore measured as above in two parts. Or thus: The hanging line e.g. is 33. Peaches: the side f.h. that bee cutteth squarewise 20. Peaches, the halfe of the which is 10. Now enter your Table as afoze, with 33. and 10. the convenient length and breadth. So shall pee finde two Acres, two Dayworkes, and two Peaches, the true content of this figure e.f.g.h.



Figures of many Angles,

Another example.

Admit i.k.l.m. land to be measured. Because it is no manner Triangle, it must be brought by imagination, as I have said, into a Triangle or Triangles. Which imagination is heere signified by the line dashed i.l. Then as above is



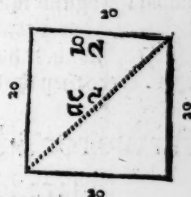
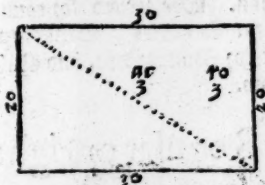
declared, it ought to bee measured (according to the rule of Triangles) in two parts, because there are two Triangles in that land. So by prooffe ye shall find in the upper i.k.l. one Acre, 3. Roodes, and five Dayworkes: in the other i.l.m. one Acre. Thus I gather the whole content of that Land, to bee two Acres, three Roodes, and five Dayworkes.

measuring of Land. 4

None otherwise of the adioynd n. o. p. q. and all other figures following: and other whatsoeuer they are, that by any meanes may be brought into Triangles.

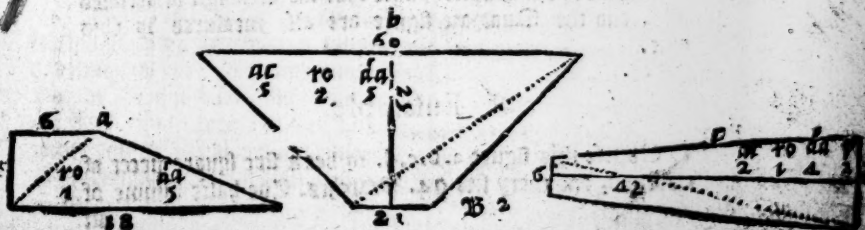
Furthermoze know that the figure i. k. l. m. is readily thus measured. Adde the Pearches of both the hanging Lines together: so haue pee 23. With this number, and with halfe the Pearches of the side, i. l. which he cutteth squirewise, being 10. Pearches, enter your Table. So is found as afoze.

These two figures following may also bee thus measured, otherwise then by the rule of Triangles. Enter your Table with their conuenient length and breadth. So shall you finde the contents of all such.



These three figures following, although they may be measured by the rule of Triangles, yet for quicker speede, they haue also their proper measuring as ensueth.

Lay together the two sides which are paralels of the first figure a. that is 6. & 18. making 24. the halfe is 12. the breadth 5. Enter with 5. and 12. your table. So haue you one roode, and five day workes. For the other two b. c. and such like, tope the heads or ends in one: and enter your table with halfe of those Pearches, and with the whole number of the middle line.



The Art of

How by supputation to measure all triangled land.

To measure
triangled land
by supputation.

Ioyne all the sides together: take halfe out of that halfe, pull every side, noting the difference. Then multiply the differences, the one in the other, and the third difference augment in the product. That which encreaseth, multiply in the halfe of all the sides ioyned. Then the Radix of the surmounting summe is the content of that Triangle.

four rules
following.

Now rest foure Rules to bee treated of. The first for all manner Regular Square Superficies. The second for round Land, and her parts. The third for Steeples, Columnes, Globes, and their parts. The last for Mountaines, and Valleys. Here they shall in order follow.

A rule for all manner Regular or right squared Land of many sides, as

5. 6. 7. 8. 9. 10. 20. 100. &c.

The liij. Chapter.

To measure
land of many
sides.



Masure and lay all the sides together, taking the halfe number. of Pearches there contained. Then draw a right hanging line from the Center or middes of that figure, or the middes of some one side. And with that length and the other, enter your Table. Note that the Triangle of all sides like, and the Quadrate figure are also measured by this rule.

Ensamble.

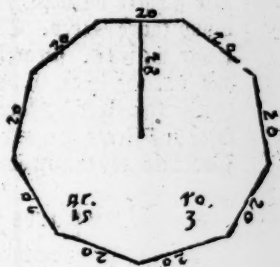
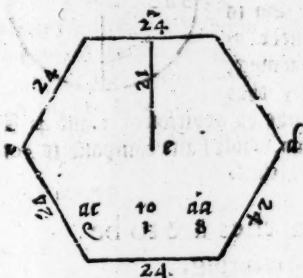
Suppose this figure a. b. c. d. to bee a five square peece of Land, and every side 24. Pearches. The halfe summe of all

measuring of Land.

5

all does is 72. Pearches: the right hanging pycked line a.c.
21. Pearches. With these two numbers yee must enter your
Table of account following hereafter. And doe as is opened
in the declaration there adioyned, when Numbers surmount
the Table as they doe here.

So shall ye finde 9. Acres, 1. Rood, and 8. Dayworkes, the
content of this figure a. b. c. d. Even thus is the other nine
squared figures measured, and such like.



A Rule for round Land, and the parts thereof.

The v. Chapter.



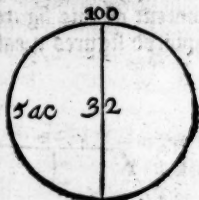
Also the Diameter multiplied in halfe the Cir-
cumference, sheweth the content of any Circle.
Or thus more plainly. Yee shall enter your
Table with halfe the number of pearches of the
whole Circumference of compasse, and with
the number of halfe the Diameter of breadth. So haue yee
the Content.

Archimedes in
libello circuli
mensurationis.

The Art of

Example.

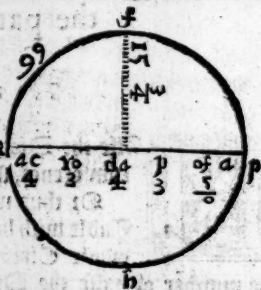
Suppose a peece of land, whereof the compasse is 100. Pearches, the breadth 32. Pearches, I would know how much Land is in this figure. Enter your Table with halfe the compasse, that is 50. and with halfe the breadth, that is 16. Pearches. Because in the Table I cannot finde 50. for the greatest length is 40. (therefore I enter with 40.) and 16. So is found foure Acres. Then I enter againe with 16. Pearches remaining, and 16. the breadth as before, that bringeth 1. Acre. Now to conclude by addition of 1. and 4. I finde five Acres in that round Land, whole halfe compasse is 50. Pearches, and the breadth 16. Pearches.



How parts of Pearches are to be counted in measuring.

For perfect knowledge and vse of this Table following, when parts of Pearches are adioyned, note well this other example that ensuech, and also what is said of the declaration annexed unto the table, when parts of Pearches are in the length, breadth, or both.

Imagine f.g. h. to bee a round peece of Land: I finde by measure the whole Compasse, 99. Pearches. The halfe is 49. $\frac{1}{2}$. The hanging Line of halfe breadth is 15. $\frac{1}{2}$. Enter your Table with the whole Pearches, that is 49. and 15. leaving out $\frac{1}{2}$ and $\frac{1}{2}$. which were but parts of Pearches. So haue



pee 4. Acres, 2. Roodes, 3. Daywozkes, and 3. Pearches. For those parts of Pearches omitted, at your first entring the Table, worke thus. The halfe Pearch, Quarter, or other part of a Pearch in the length, must bee reckoned by themselves in the whole breadth, and those of the breadth contrariwise in the length. If there bee such odde partes in both, then reckon them of the length in the whole breadth, and them of the breadth in the whole length, topning to the other afore gotten, remembryng the product of the one fraction multiplied in the other, to bee pulled from the increase. To make this matter plaine, I will take this last example before. The one number wherewith I should haue entred my table, was $49\frac{1}{2}$. the other $15\frac{1}{2}$. I found first by entring with 49. and 15. (omitting the odde partes) 4. Acres, 2. Roodes, 3. Daywozks, and 3. Pearches. Now for the increase of the parts of Pearches left out, I must (as I said) reckon them of the length in the breadth, and contrariwise them of the breadth in the length. Halfe $15\frac{1}{2}$. is 7. Pearches, and $\frac{1}{2}$. Three quarters of 49. is 37. Pearches, $\frac{1}{8}$. Which added, makes 45. Pearches. This adtopned to the number afore gotten, bringeth the whole content of the round figure, which is 4. Acres, 3. Roods, 4. Daywozks, 3. Pearches, and $\frac{1}{8}$. of a Pearch, the product of the one fraction multiplied in the other subtracted. What must be done when the numbers wherewith pee should enter, excede your table, counsell the declaration of your table there adtopned.

Of the halfe Circle.

For this halfe circle, enter the Table with halfe the compasse, and with halfe the Diameter of the Circle, or with the length of the picked hanging line, k.l. So the content of this halfe Circle is 2. Acres, 1. Rood, 7. Daywozkes, 1. Pearch, and $\frac{1}{8}$. of a Pearch.



To measure
halfe circled
Land.

Another

The Art of

Another example of Portions and parts of a Circle.

Suppose n.m.o. following, were part of a Circle or peece of Land, whose Content wee desired. The whole compasse of the Circle which this portion representeth, is (as afore-said) 99. Bearches: his Diameter or breadth 31. $\frac{1}{2}$. The prickd Arke or Compasse, n.m.o. is 74. Now with the halfe Breadth or Semidiameter of the Circle, 15. $\frac{1}{2}$. and with 37. the halfe of the prickd Compasse: enter your Table. So haue wee 3. Acres, 2. Roodes, 5. Day workes, 2. Bearches, and $\frac{1}{2}$. of a Bearch, the Content of the peece of Land full of prickes, to the sides of the Triangle prickd.

To measure
parts of circled
Land.

If ye desire to know the sum of Bearches in the other portion beneath the Triangle, separated by the Line m.o. wee must adde the Content of the Triangle (which is 3. Roodes and $\frac{1}{2}$. of a Bearch, found by the Rule of Triangles) to the Acres and Bearches before searched. So haue we 4. Acres, 1. Rood, 5. Day workes, three Bearches, and $\frac{1}{2}$. of a Bearch.

This subtracted or pulled from the number contained in the whole Circle, the remaine is the Bearches included in the small peece beneath the Triangle. That is, 1. Rood, 36. Bearches, and $\frac{1}{2}$. of a Bearch.



How mixed Figures are measured.

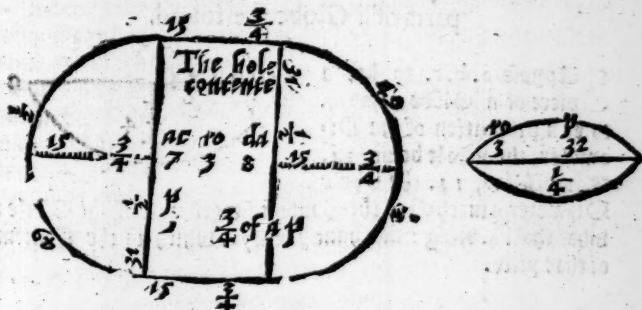
Land com-
pounded of
circles, or his
parts.

I Thinke none now will doubt how these two figures fol-
lowing are measured, because they are made of portions or
parts of Circles, whose measure is before sufficiently open-
ned

measuring of Land.

7

ned, the one consisting of two halfe Circles, and a Quadrangle: the other being the portions of the Circle, m.o. doubled.



If any unill fashioned Land chance to bee measured, which required to be brought into many Triangles, so saue labour, yee may adde some portion vnto that, and make it Square, or otherwile. So let them bee measured: and after, from the product pull away that yee added: the remaine is the Content.

To finde the content superficiall of Steeples, Columnes, Globes, and their parts.

TO the Arithmetician, I say: for picked Steeples, multiply the whole side in halfe the circumference of the Base, adding the plaine of that Base. For pillars: augment the Circumference of the Base in the Heights, putting to the plaine of both Bases. For Globes, the diameter in the Circumference multiplied. Euen so of fragments or parts. Let them that bee void of Arithmetike enter my Table of account following, with such numbers as I now willed the Arithmetician to multiply, not forgetting what I haue before written. So **A**lerue their turne.

To measure Steeples, Columns, Globes, &c.

Or

The Art of measuring

Or thus by the rule of proportion, the parts of a Globe are found.

To measure parts of Globes.

Suppose a. b. c. to bee a Spiece of a Globe, and 4. to be a proportion of the Diameter, the whole being 14. Thus I say, 14. the whole Diameter giueh 616. the Content Superficiall of the Circle: what shall 4. being: So haue pee 176. which is the Content of that piece.



To finde the Diameter by some knowne portion thereof.

To finde the vnknowne Diameter of a Globe.

If ye bee ignorant what length the Diameter of the Globe is, whole proportion pee haue, the height or part of the Diameter being 4. foot, augment halfe the line a. b. which is 6. $\frac{1}{2}$. in himselfe, and the product diuide by 4. So haue pee 10. to be added to 4. which maketh 14. the whole Diameter.

The true measuring of Mountaines and Valleyes.

The vi. Chapter.

To measure Mountaines.



Ye shall measure the circuit of the Foot, or Base of the Mountaine: then the compasse of the summit or top, adding them together. So shall ye see of the Ascensies, that is, the going up from the foot to the top, turning the measure of the longer and shorter in due. Now take the halfe of the circuit added, and the halfe part of the Ascensies ioyned, and enter you table: there shall ye see the Content.

Ensample.

Ensample.

A.b.c. is the mountaine: a.c. the circuit of the Base, being 100. Pearches, b. the top 16. Pearches. Which ioyned together, make 116. b. c. the one Ascent is 55. Pearches: the other 75. These added make 130. The halfe of the circuits is 50. the halfe of the Ascensses 65. with these two summes pee shall enter your table of account, where pe shall find 23. Acres, 2. Roodes, and 10. Pearches, the true content of this figured hill.

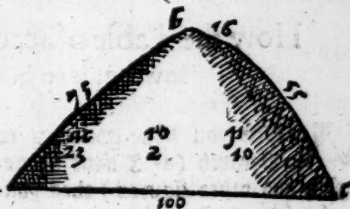


Figure of a Mountain.

Of the Valley.

As in the Mountaine pee measured the circuit of compasse To measure
of the Base or Foote: so here contrary pee shall meete Valleys.
round about the circuit of compasse of the height of the Val-
ley. And as pee got the measure of compasse of the top of the
Mountaine, so measure the circuit of the depth of the Valley.
In like manner as pee measured the Ascent, that is, the go-
ing up from the foote to the top: so measure the Descent of
going downe of the Hill to the depth of the Valley. The rest
all worke, as I haue shewed you in measuring the Mountaine.
For more plaine-
nesse, behold this
ensample of a
gure. If pee lay
together the cir-
cuits of the
height and depth,
which is 210.
and 30. taking the halfe art of those two Circuites, making

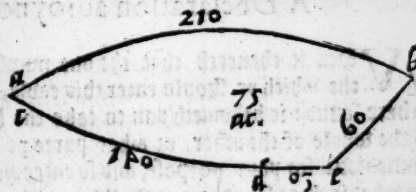


Figure of a Valley.

The Art of measuring

an 120. then the two Ascenses 140. and 60. added in one product 200. the halfe thereof being 100. with this and 120. the other halfe of the Circuite, ye may enter your table. That doing, loe 75. Acres.

How the Table of account now following, is to be vsed.

What is to be done when numbers, with which you should enter, exceede your Table.

When you haue gotten a conuenient Length and Breadth (as I haue aboue declared by diuers triangles and other figures) then you shall enter this Table. Seeke there the Length, and most number of Pearches in the higher margiae, which beginneth at 1. and endeth rightward at 40. Looke the other summe of Pearches (I meane the breadth) in the right side and hanging margine, from 1. descending to 30. Now at the meeting of the lines, where the one answereth the other directly in a square, you shall finde the Acres, Roodes, Day workes, and Pearches. Note that the first number set on the left side, and vpper part in any square, signifieth the number of Acres. The figure 1. set in the vpper part, and right side, both betoken a Roode: the figure 2. there two Roodes. 3. three Roodes. And the figure in the left side beneath, signifieth a Day worke, or Day workes. A figure in the lower part rightward, declareth Pearches.

A Declaration adioyned.

When it chanceth that the one number or both with the which ye should enter this table, are greater then any here found: it becometh you to take the halfe of the one, and the whole of the other, or what parts ye list of both, most commodious for your purpose, and so enter your table. Looke then what is there found, and it shall beare his name of the parts multiplied in themselves.

Ensample.

Mountaines and Valleys. 9

Ensample.

Suppose the number with the which yee should enter your table to bee 130 Pearches in length, and the breadth 60. neither of these may be found in the Margines: wherefore I take the third part of an 130. which is 34. Pearches, and one remaineth.

The halfe 60. that is 30. I finde with entering them at the common meeting, 6. Acres, 1. Roode, and 5. Day workes. This summe must haue his name of the parts augmented in themselves. I tooke the third part of the one, and halfe the other number, therefore 2. must be multiplied in 3. or contrarie: so haue ye sixe, which signifieth that ye haue found by entering, but the sixth part of the number ye should finde. Wherefore I must take this summe tofore found (being Acres, 1. Roode, and 5. Day workes) sixe times as much. So haue ye 33. Acres and one Roode. For the Pearch remaining in length, reckon him in the breadth (as is afore declared) in the fifth Chapter of the Remaines: so haue yee 60. Pearches more to be added. So the encrease of these two numbers, 103. and 60. amount to 38. Acres, two Roodes, and 5. Day workes. Thus any manner length and breadth is reduced to this table following, which sufficeth.

Looke what I haue shewed in the Chapter of parts, that vnderstand here of whole Pearches, left subtracting, &c.

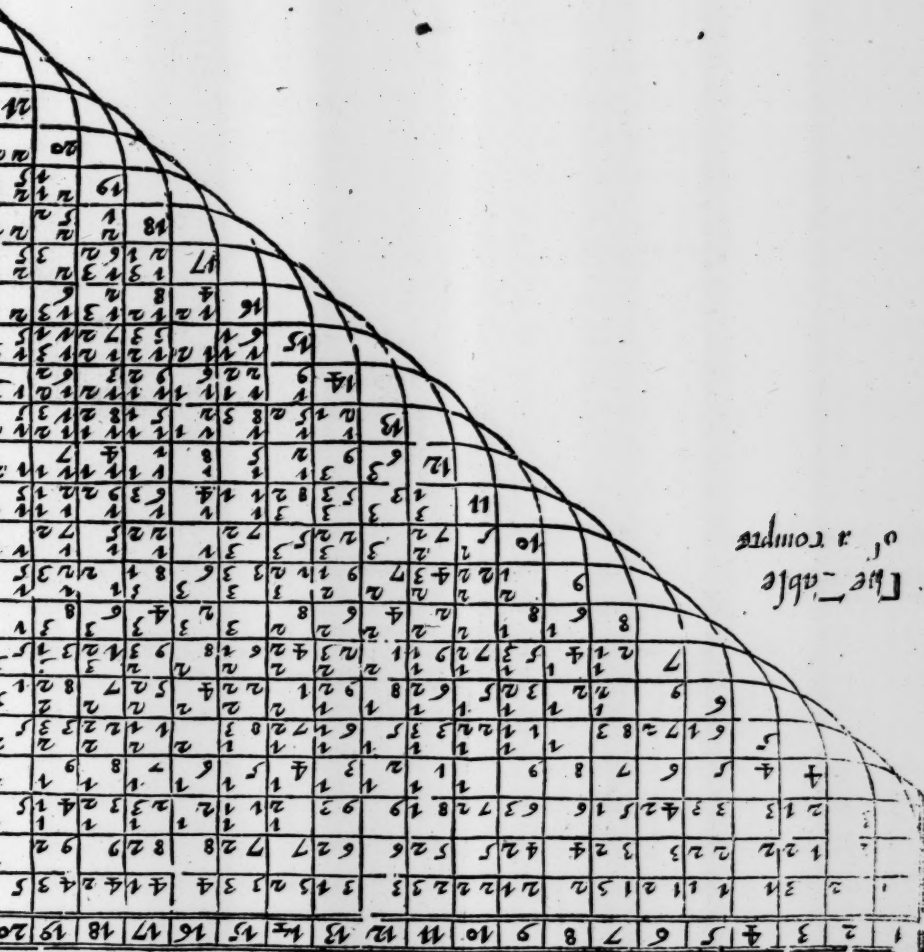
Thus with few words is ended the certaine measuring of all manner Land, touching the Superficiall Contents. Wherefore now shall follow the true measuring of Timber, Stone, Steeples, Pillers, Globes, according to their Circumference.

Such as are altogether ignorant of Arithmetike, may reckon by our English coppe, allowing for euery Pearch in length or breadth a penny, and so euery Parke makes an Acre, euery Noble halfe an Acre, euery forty pence or halfe Noble, a rood, and euery penny a square Pearch. And so by memorie without tables, may in some rude and grosse manner, cast by reasonable iust the true Contents of all Cloles, Hedowes, Parkes, Hills or Valleys.

COMPUTATIONIS

19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66
67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88
89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110
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815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836
837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858
859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880
881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902
903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924
925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946
947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968
969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990
991	992	993	994	995	996	997	998	999	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012
1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034
1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056
1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078
1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100
1101	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122
1123	1124	1125	1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140	1141	1142	1143	1144
1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166
1167	1168	1169	1170	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188
1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201	1202	1203	1204	1205	1206	1207	1208	1209	1210
1211	1212	1213	1214	1215	1216	1217	1218	1219	1220	1221	1222	1223	1224	1225	1226	1227	1228	1229	1230	1231	1232
1233	1234	1235	1236	1237	1238	1239	1240	1241	1242	1243	1244	1245	1246	1247	1248	1249	1250	1251	1252	1253	1254
1255	1256	1257	1258	1259	1260	1261	1262	1263	1264	1265	1266	1267	1268	1269	1270	1271	1272	1273	1274	1275	1276
1277	1278	1279	1280	1281	1282	1283	1284	1285	1286	1287	1288	1289	1290	1291	1292	1293	1294	1295	1296	1297	1298
1299	1300	1301	1302	1303	1304	1305	1306	1307	1308	1309	1310	1311	1312	1313	1314	1315	1316	1317	1318	1319	1320
1321	1322	1323	1324	1325	1326	1327	1328	1329	1330	1331	1332	1333	1334	1335	1336	1337	1338	1339	1340	1341	1342
1343	1344	1345	1346	1347	1348	1349	1350	1351	1352	1353	1354	1355	1356	1357	1358	1359	1360	1361	1362	1363	1364
1365	1366	1367	1368	1369	1370	1371	1372	1373	1374	1375	1376	1377	1378	1379	1380	1381	1382	1383	1384	1385	1386
1387	1388	1389	1390	1391	1392	1393	1394	1395	1396	1397	1398	1399	1400	1401	1402	1403	1404	1405	1406	1407	1408
1409	1410	1411	1412	1413	1414	1415	1416	1417	1418	1419	1420	1421	1422	1423	1424	1425	1426	1427	1428	1429	1430
1431	1432	1433	1434	1435	1436	143															

Place this Table after the White page in C.



of a Table
The Table

TABULA

This image shows a large, dense grid of handwritten numbers, likely a ledger or account book. The grid is composed of many small squares, each containing a number. The numbers are written in a cursive or semi-cursive script, typical of 18th or 19th-century handwriting. The grid is organized into columns and rows, with some larger numbers appearing in certain columns, possibly representing totals or specific categories. The overall appearance is that of a historical document, possibly a financial record or a mathematical table.

1. The first of these is the fact that the Commission has not yet received any information from the Government of the United Kingdom regarding the progress of its investigation into the alleged involvement of British intelligence agencies in the assassination of Dr. Martin Luther King.



To the Reader.



T commeth commonly to passe, that Carpenters, Masons, and such like Artificers, are put either to measure timber euery way square, or squared logs, broader on the one side than on the other: yea many times mutilate or vnperfect stufte. Sometimes three, siue, tenne, or twenty, square in the head, and so through: oftentimes round Stone or Timber with hollowed, &c. Afore I shew vnto them what must bee done with such pieces of Timber or Stone, to get their true measure, my desire shall bee that such Craftsmen will leaue to be heady or selfe willed: yea so greedily to sticke to their corrupted rules, that vtterly they refuse to be taught.

Both learning and experience declareth vnto me, that the grounds which the best of them haue, are false. To open how and where, it needeth not: neither doth it appertaine to instruction, onely it may suffice him that liketh the true way, here to receiue it appointed to him. Yet to satisfie and content him which will not belecue any such errours or false grounds to bee, I say (and truely) that the Ruler of Timber measure, which the most part of them hath, is not made by right Art: Besides that, their craft in seeking the Square of some Timber is very false. They vse in measuring, to lay the broader and narrower sides together in a surame, and to take the halfe of that number for the Square. Then they seeke this vntrue Square vpon the false Ruler, and so measuring the Timber, they conclude of it vntuely.

As

To the Reader.

In a foote
Square is con-
tained 172.
Inches.

As this is corrupted, so are other Grounds which they take to be infallible. Now to the purpose: touching the correction of those Errours, with other not mentioned, whereby true measuring may ensue, this way shall be taken. After I haue opened how you must handle all such fashioned Timber (as afore is spoken of) there shall follow a Table in which yee may finde (as I will declare) the Square of any Stone or Timber. That knowne, it is requisite to haue another Table immediately following, which may appoint to all true Squares from 1. to 6. inches, the iust length to make a foote euery way Square. With the length agreeable to your Square, your Logge must bee measured. And as oft as ye finde it from the one end to the other of your Timber, so oft you may conclude the foot Square to bee contained in that Timber Logge, or Stone: that is, so many Square Feet there to bee included. This Table of Timber measure standeth in the place of a good Ruler, well decked with true measures. By this yee may make or correct Rulers at pleasure, as after appeareth.

*Now orderly followeth the true measuring of all fashioned
Timber or stone aforementioned.*



How Timber or Stone fouresquare euery
way, or broader on the one side than on
the other, is measured.

The vij. Chapter.

If a piece of Timber or Stone, bee either
equally square, broader on the one side,
than on the other, yee shall take the iust
measure, I meane, how many Inches
the broader side containeth: euen so of
the narrower. This done, yee must seeke
in the Table of Squares following, the
measure of the broader side of the Tim-
ber or Stone, in the vpper margine of that Table. Then
looke for the number of Inches, of the equall or narrower side,
in the right part and hanging Margine. At the common mee-
ting where the one number answereth directly to the other,
there your true Square shall appeare. This square so found,
shall bee referred to your Table of Timber measure: in the
which you may plainly see (if you runne downe by the left
Margine, vntill your Inches square appeare) how many feet
or Inches of your Ruler belong to a Foote square. As often
as that measure there found, is contained in the Timber or
Stone, so often and as many feete square yee may conclude
(without doubt) the piece of Timber or Stone to haue.

D

Ensamble.

The Art of measuring

Ensampler.

Suppose this squared Timber or Stone a. b. c. d. were to be measured, the broader side a. b. 20. Inches, the narrower side b. c. 13. Inches, the length 40. Inches. Now I must seeke the broader side 20. in the vpper Margine of the table. The narrower side 13. must bee found in the right side and hanging Margine. At their common meeting 16. Inches, and $\frac{1}{2}$. part of an Inch shall appeare. This true square must bee searched for in the table of timber measure. Therefoze looke for 16. in the Margine of this table. In the Squares with him rightward, ye shall finde 6. inches, and $\frac{1}{4}$. which is thzee quarters of an Inch. Some deale lesse of your Ruler than 6. and $\frac{1}{4}$. laid out vpon the timber, maketh a Foote Square. And that measure so directly handled, is contained in the Length of your Timber sixe times. Wherefoze affirme sixe Foote there to be, beside that is left $\frac{1}{2}$. part of a Foote. Note because the Squares at all times (in this Ensampler) rise not to euen Inches, but sometime to odde parts: therfoze according to your discretion, adde or take away some part more or lesse in setting forth the Foote Square, as aboue is performed.



It were intolerable tediousnesse, yea impossible to set forth the true quantities of timber measure, to all odde Quantities of Squares. The discrete handling of these, the wittie shall bring to a sufficient exactnesse.

Timber or Stone.

12

Of Timber or Stone, 3.5.10.20. or
more sides Square, &c.

The viij. Chapter.

When Timber hath diuers equall Squares in the head, and so thorough: first, measure all the Square sides round about the head or end of the Timber. Then take halfe the number of the whole measure for one breadth.

Then measure from the Center (which is the middle of the head, or end of the Timber) to the middell of the Square side, betweene the two Angles, and take the measure of that distance for the other breadth. Now resort with the measures of these two breadths, (as before) to the Table of Squares: seeing the bigger number of breadth in the upper Margine, and the other lesser in the side Margine. With the Square there found, haue recourse to the Table of Timber measure, and doe as I haue instructed.

Ensample.

Admit this small piece of Timber five square, c.f.g.h. should bee measured, every side being 12. Inches. If ye adde together in one summe all the five sides, they make 60. Inches. The halfe is 30. that serueth for one breadth. When the Line c. f. which goeth from the Center or middell of the Square, to the middle of one side, is 8. Inches. The two number 30. and 8. must be sought (as before) in the table of Squares following. At the common meeting, your square shall appeare 15. Inches, & $\frac{1}{2}$. This square 15. seeke in the Table of Timber measure. There yee may see right with it 7. Inches, and $\frac{1}{2}$. Now because of $\frac{1}{2}$ the odde quantitie of the



D 2

Square

The Art of measuring

Square about 15. Inches, lay something lesse. When see how oftentimes that measure (so with discretion handled) is from the one end of your Timber to the other: and affirme so many times a Foote square there to be, as that measure is found in the length of your Logge.

How round and hollow Timber, Steeples, Pillers, Globes, &c. are to be measured.

The ix. Chapter.



First gird the Logge round about with some Line: then diuise the Line which compasseth that timber in two equall parts: keepe the one part for the bigger breadth. After, ye shall diuise againe that whole length (the two and twenty part cast away) in three parts, and take the halfe of one of them for the other narrower breadth. With the measures of these two breadths, haile to your table, performing all things as afoze is opened.

Ensample.

Suppose this little piece of Timber, i. k. l. m. were to be measured, the compasse. or girding 36. Inches, and the halfe of that is 18. being the one breadth: then the third of 36. is 12. the halfe of it is 6. which is the other narrower breadth, with these two numbers 6. and 18. enter the Table of Squares following, and so the table of Timber measure. At the last (all things performed as befoze) ye shall finde in this round Logge, the length l. m. being 18. Inches, 1. Foote, and $\frac{1}{2}$ part of a Foote. This is sufficient for all such like.



A note of hollowed Timber.

If it chance that hollowed Timber bee to bee measured: measure the whole Logge as though it were not hollow, as above is declared. Then measure the narrower and broader side of the hollow, and see what is contained in that, as though it were massie Timber. Now pull out the content of it, from the whole above measured: the remaine of force must shew what timber is included in that hollowed body.

IAm unable in few words to expresse to the vnlearned, by what meane Pyramidall, or picked regular Steeples of all fashions are measured. Also how Pillers, how the content of Globes or Bowles are searched, vnlesse the Art of numbering were talked. That being knowne: thus (as now followeth) I teach.

How the crassitude of picked Steeples is knowne.

Multiply the plaine of the Base in the third part of the Height: so pee haue the Crassitude. Or multiply the Content superficiall (found as I haue instructed) in the Height of the Steeple, taking for your purpose the third part of that product.

How the Content of Pillers is knowne.

Ecrease the Base plaine in his Altitude or Height: so haue ye your desire.

D 3

How

The Art of measuring

How the Cubicall bodies of Globes
are searched.

The content Superficiall found, (as I haue opened) mu-
be multiplied in the sixth part of the Diameter: the pro-
duct is that wee require: Or the third part of the superficiall
Content in halfe the Diameter. Or multiply the plaine of the
Circle in the whole Diameter: then take two third parts,
which added, make the Crassitude.

Of the halfe Circle.

His Superficiall Content multiplied (as I said) bringeth
the magnitude of him. If any man require enamples
of these last matters, or more sufficient handling: let them re-
sort vnto my booke published of Geometrie, where they shall
be satisfied. These little appertaine to Carpenters or Masons:
therefore not by ensample declared.

A generall note.

When thou shalt bee put to measure some Body, with-
out order or fashion, lacking part of his Square, or
hauing more than his forme: if it lacke thou shalt make it
perfect, by obseruing diligently the running together of the
sides. The parts wanting shall bee measured, as though they
were there, which portions must be taken from the whole Bo-
dy measured.

Also when there resulteth any more than the forme of Re-
gular Square: first measure the square Body: then the Cras-
situde which aboundeth. All put together, doe shew the whole
irregular Body. This sufficeth.

**A Table to finde the iust Radix or Square
of any Timber or Stone.**

T behoueth you to know, that this table following is made for the true square of any manner timber: therfore vnderstand that the numbers from 1. to 40. set aboue in the high Margine, betoken the Inches of the broader side of the timber. And the numbers from 1. and so downeward to 30. put in the right part and hanging Margine of this table, signifie the Inches of the narrower side: and to conclude briefly, the Element of figures set in euery square roome, betoken the iust square. The bigger figures leftward in euery square place, signifie the whole Inches. And the other lesser rightward in the same square diuided by a line, the parts of Inches, as $\frac{1}{2}$, &c.

This first fraction toward the left hand, betokeneth one halfe part of an Inch: the other two fifts of an Inch, and euery figure of fraction hauing a point adioyned vnto him, some deale lesse than that part is: as that part, $\frac{1}{2}$ representeth scant halfe an Inch, a very little quantitie lesse. And if it had two prickes by him, he should haue declared some quantitie more: as this other fraction of part, $\frac{2}{3}$: which is more than two fifts, a small deale.

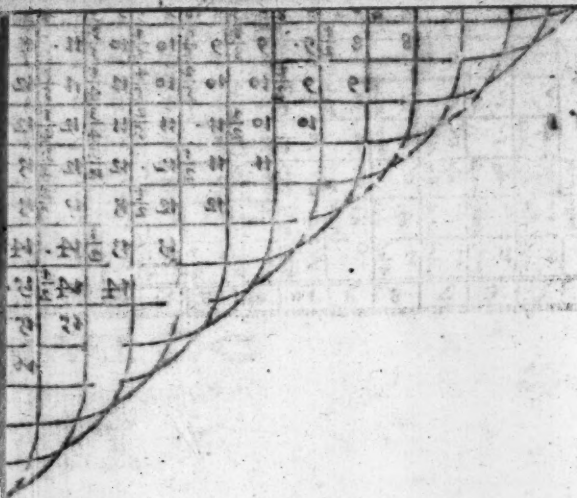
It had not bene needfull to haue put the parts of the Square so precisely as they are here: neither is it requisite so curiously to take them.

∞ TABVLA

The Table
of Squares

place this Table betwixt D and E.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	4	9	16	25	36	49	64	81	100	121	144	169	196	225	256	289	324	361	400	441	484	529	576	625	676	729	784	841	900	961	1024	1089	1156	1225	1296	1369	1444	1521	1600	1681	1764	1849	1936	2025	2116	2209	2304	2401	2500	2601	2704	2809	2916	3025	3136	3249	3364	3481	3600	3721	3844	3969	4096	4225	4356	4489	4624	4761	4900	5041	5184	5329	5476	5625	5776	5929	6084	6241	6400	6561	6724	6889	7056	7225	7396	7569	7744	7921	8100	8281	8464	8649	8836	9025	9216	9409	9604	9801	10000



Die Tage
2. April

Die Tage des Monats April

The Table of Timber measure, with the declaration and vse of it.

13

The x. Chapter.

This Table (as pee see) is diuided into two Columnes of Rowes: the one very short, the other longer. In the head of the first, I haue put this word Foot: in the second row, Inches, and parts to signifie Feet, Inches, and parts of Inches. The summes in the margine and left part of the first and second columnne, declare the quantitie of the Square of Timber of Stone from 1. to 35. Inches square. Within the rowes you may find the iust length to a foot square, if ye enter into them in right order according to the square.

Ensample.

Suppose the Square of your Timber were 7. Inches, and that pee desired to know what measure of length of the ruler would make a Foote square: seeke in the left margine, seuen Inches: and with him in that order toward the right hand, ye shall finde 2. foote 11. Inches, and $\frac{2}{3}$ of an Inch. Note because the fraction $\frac{2}{3}$ hath a prick by him, it betokeneth some small quantitie lesse then $\frac{2}{3}$ of an Inch. If it had two prickes of points thus: $\frac{2}{3}$ it should signifie some little quantitie more. Neither maketh it matter whether pee obserue this picking or no, the quantitie is so little to bee added or pulled away.

Note what hath bene spoken of Timber, the same also is to bee understood of Stone, likewise to bee measured.

Thus is finished the measuring of Timber.
Now ensueth of boord.

Foot			
Inches	Parts	Foot	
		1	144
		2	36
		3	16
		4	9
		5	5
		6	4
		7	2
		8	2
		9	0
Square	Inches	Foot	
		10	17
		11	14
		12	12
		13	10
		14	8
		15	7
		16	6
		17	6
		18	5
Inches	Parts	Foot	
		19	4
		20	4
		21	3
		22	3
		23	3
		24	3
		25	2
		26	2
		27	2
Inches	Parts	Foot	
		28	2
		29	2
		30	1
		31	1
		32	1
		33	1
		34	1
		35	1
		36	1

How

Tables, Boord, or Glasse.

How Tables, Boords, Glasse, or any such like, are measured, according to their length and breadth, onely to the foot square.

The xi. Chapter.



This thing is performed by the helpe of a large Table following, diuided in five small Tables, and as many Margins. The first and left Margin beginneth at $\frac{1}{4}$ which is one quarter of an Inch, and extended to five Inches, as ye may plainly perceiue if ye runne downe by that Margin. This hath his Table on the right side adioyning vnto him. The other taketh his beginning at five Inches, $\frac{1}{4}$ and endeth at twelue, hauing his proper Table also. The third from $12\frac{1}{4}$ to $18\frac{1}{4}$. And so from $18\frac{1}{4}$ to $24\frac{1}{4}$ from $24\frac{1}{4}$ to $30\frac{1}{4}$. The last Margine is from $30\frac{1}{4}$ to 39 , and there endeth.

Of this that is said, you may gather that euery Margin hath his Table on his right side. Also you must know that in the top, and beneath, I haue put (as in the Table of Timber measure) these words, Foot, Inch, and parts, to signifie, Feet, Inches, and parts of an Inch. Whensoeuer pee list to measure boord, Glasse, or any other such, with the breadth of it, enter this table, and seeke that breadth in his proper margin; there ye shall finde in right ouer how many Feet, Inches, or parts of an Inch, belöng to a Foote square. So often as the measure is in your Rulle, list as many Feet haue ye in that Boord, or such like. If the breadth exceed this table, then diuide the breadth in parts, and worke as is and shall be declared. So the ingenious apperteyn this Table for all manner breadths, most exactly.

Example.

Fo Yn				Fo Yn				Yn Par				Yn Par				Yn Par				Yn Par							
1	4	48		6	1	11	$\frac{1}{25}$	12	$\frac{1}{4}$	11	$\frac{3}{4}$	18	$\frac{1}{4}$	7	$\frac{7}{8}$	24	$\frac{1}{4}$	5	$\frac{15}{16}$	30	$\frac{1}{4}$	4	$\frac{3}{4}$				
1	2	24		6	$\frac{1}{2}$	10	$\frac{1}{7}$	12	$\frac{1}{2}$	11	$\frac{1}{2}$	18	$\frac{1}{2}$	7	$\frac{7}{8}$	24	$\frac{1}{2}$	5	$\frac{7}{8}$	30	$\frac{1}{2}$	4	$\frac{5}{7}$				
3	4	16		6	$\frac{3}{4}$	12	$\frac{1}{3}$	12	$\frac{3}{4}$	11	$\frac{2}{7}$	18	$\frac{3}{4}$	7	$\frac{7}{8}$	24	$\frac{3}{4}$	5	$\frac{4}{5}$	30	$\frac{3}{4}$	4	$\frac{2}{3}$				
I	12			7	1	8	$\frac{4}{7}$	13	11	$\frac{1}{15}$		19	7	$\frac{4}{7}$	25	5	$\frac{1}{4}$		31	4	$\frac{5}{8}$						
1	$\frac{1}{4}$	9	7	$\frac{1}{2}$	7	$\frac{1}{4}$	17	$\frac{7}{8}$	13	$\frac{1}{4}$	10	$\frac{7}{8}$	19	$\frac{1}{4}$	7	$\frac{1}{2}$	25	$\frac{1}{4}$	5	$\frac{2}{3}$	31	$\frac{1}{4}$	4	$\frac{5}{8}$			
1	$\frac{1}{2}$	8		7	$\frac{1}{2}$	17	$\frac{1}{5}$	13	$\frac{1}{2}$	10	$\frac{2}{3}$	19	$\frac{1}{2}$	7	$\frac{1}{2}$	25	$\frac{1}{2}$	5	$\frac{5}{8}$	31	$\frac{1}{2}$	4	$\frac{4}{7}$				
1	$\frac{3}{4}$	6	10	$\frac{2}{7}$	7	$\frac{3}{4}$	16	$\frac{4}{7}$	13	$\frac{3}{4}$	10	$\frac{1}{2}$	19	$\frac{3}{4}$	7	$\frac{2}{3}$	25	$\frac{3}{4}$	5	$\frac{3}{8}$	31	$\frac{3}{4}$	4	$\frac{1}{2}$			
2	6			8	1	6		14	10	$\frac{2}{7}$		20	7	$\frac{1}{5}$	26	5	$\frac{1}{2}$		32	4	$\frac{1}{2}$						
2	$\frac{1}{4}$	5	4	8	$\frac{1}{4}$	15	$\frac{3}{7}$	14	$\frac{1}{4}$	10	$\frac{3}{7}$	20	$\frac{1}{4}$	7	$\frac{1}{8}$	26	$\frac{1}{4}$	5	$\frac{1}{2}$	32	$\frac{1}{4}$	4	$\frac{1}{2}$				
2	$\frac{1}{2}$	4	9	$\frac{3}{5}$	8	$\frac{1}{2}$	14	$\frac{15}{16}$	14	$\frac{1}{2}$	9	$\frac{7}{8}$	20	$\frac{1}{2}$	7	$\frac{1}{2}$	26	$\frac{1}{2}$	5	$\frac{3}{7}$	32	$\frac{1}{2}$	4	$\frac{3}{7}$			
2	$\frac{3}{4}$	4	4	$\frac{3}{8}$	8	$\frac{3}{4}$	14	$\frac{3}{4}$	14	$\frac{3}{4}$	9	$\frac{3}{4}$	20	$\frac{3}{4}$	6	$\frac{15}{16}$	26	$\frac{3}{4}$	5	$\frac{3}{8}$	32	$\frac{3}{4}$	4	$\frac{3}{8}$			
3	4			9	1	4		15	9	$\frac{5}{8}$		21	6	$\frac{6}{7}$	27	5	$\frac{1}{2}$		33	4	$\frac{1}{2}$						
3	$\frac{1}{4}$	8	$\frac{1}{3}$	9	$\frac{1}{4}$	13	$\frac{4}{7}$	15	$\frac{1}{4}$	9	$\frac{3}{7}$	21	$\frac{1}{4}$	6	$\frac{4}{5}$	27	$\frac{1}{4}$	5	$\frac{2}{7}$	33	$\frac{1}{4}$	4	$\frac{1}{2}$				
3	$\frac{1}{2}$	3	5	$\frac{1}{8}$	9	$\frac{1}{2}$	13	$\frac{1}{7}$	15	$\frac{1}{2}$	9	$\frac{2}{7}$	21	$\frac{1}{2}$	6	$\frac{1}{5}$	27	$\frac{1}{2}$	5	$\frac{2}{9}$	33	$\frac{1}{2}$	4	$\frac{2}{7}$			
3	$\frac{3}{4}$	2	$\frac{2}{5}$	9	$\frac{3}{4}$	12	$\frac{3}{4}$	15	$\frac{3}{4}$	9	$\frac{1}{8}$	21	$\frac{3}{4}$	6	$\frac{5}{8}$	27	$\frac{3}{4}$	5	$\frac{1}{5}$	33	$\frac{3}{4}$	4	$\frac{1}{4}$				
4	3			10	1	2	$\frac{2}{5}$	16	9			22	6	$\frac{11}{12}$	28	5	$\frac{1}{8}$		34	4	$\frac{1}{4}$						
4	$\frac{1}{4}$	2	9	$\frac{7}{8}$	10	$\frac{1}{4}$	12	$\frac{1}{21}$	16	$\frac{1}{4}$	8	$\frac{6}{7}$	22	$\frac{1}{4}$	6	$\frac{1}{2}$	28	$\frac{1}{4}$	5	$\frac{3}{12}$	34	$\frac{1}{4}$	4	$\frac{3}{13}$			
4	$\frac{1}{2}$	2	8	$\frac{1}{10}$	10	$\frac{1}{2}$	11	$\frac{3}{4}$	16	$\frac{1}{2}$	8	$\frac{3}{4}$	22	$\frac{1}{2}$	6	$\frac{1}{8}$	28	$\frac{1}{2}$	5	$\frac{1}{16}$	34	$\frac{1}{2}$	4	$\frac{1}{6}$			
4	$\frac{3}{4}$	2	6	$\frac{1}{5}$	10	$\frac{3}{4}$	11	$\frac{3}{8}$	16	$\frac{3}{4}$	8	$\frac{5}{8}$	22	$\frac{3}{4}$	6	$\frac{1}{5}$	28	$\frac{3}{4}$	5		34	$\frac{3}{4}$	4	$\frac{1}{8}$			
5	2	4	$\frac{4}{5}$	11	1	1	$\frac{1}{11}$	17	8	$\frac{1}{2}$		23	6	$\frac{1}{4}$	29	5			35	4	$\frac{1}{8}$						
5	$\frac{1}{4}$	2	$\frac{2}{5}$	11	$\frac{1}{4}$	1	$\frac{4}{5}$	17	$\frac{1}{4}$	8	$\frac{1}{2}$	23	$\frac{1}{4}$	6	$\frac{1}{5}$	29	$\frac{1}{4}$	4	$\frac{7}{8}$	35	$\frac{1}{4}$	4	$\frac{3}{2}$				
5	$\frac{1}{2}$	2	$\frac{2}{5}$	11	$\frac{1}{2}$	1	$\frac{1}{2}$	17	$\frac{1}{2}$	8	$\frac{1}{5}$	23	$\frac{1}{2}$	6	$\frac{1}{8}$	29	$\frac{1}{2}$	4	$\frac{7}{8}$	35	$\frac{1}{2}$	4	$\frac{1}{16}$				
5	$\frac{3}{4}$	2	$\frac{1}{25}$	11	$\frac{3}{4}$	1	$\frac{2}{7}$	17	$\frac{3}{4}$	8	$\frac{3}{12}$	23	$\frac{3}{4}$	6	$\frac{1}{16}$	29	$\frac{3}{4}$	4	$\frac{5}{6}$	35	$\frac{3}{4}$	4	$\frac{1}{12}$				
6	2			12	1			18	8			24	6		30	4	$\frac{4}{5}$		36	4							
Fo Yn				Fo Yn				Yn Par				Yn Par				Yn Par				Yn Par							

The Art of measuring.

Ensamble.

Suppose I haue a pane of Glasse, or a Boord, whose breadth were 22. inches, $\frac{1}{4}$. the length 16. foot. In the fourth machine, I finde this breadth, 22. and $\frac{1}{4}$. And euen with it in the table rightward, I see 6. inches, $\frac{1}{4}$. So much of my Ruler wanting some small quantity, maketh a foot.

Now because in the length of my boord (which is 16. foote) that measure is found 29. times, and $\frac{2}{3}$ parts: I conclude 29. foote there to be, and two third parts of a foote Square, according to the length and breadth I said (wanting some small quantity) because of the point toynd to this fraction $\frac{2}{3}$. which is put to diminish the fraction some little thing, as is declared plainly in the other Tables before put forth.

He that desireth to measure chamber floores, pauements, or such like, let him onely multiply the breadth with the length, so the product sheweth the Content.

Ensamble.

If there were a pauement 100. foot long, and in breadth 50. I must needs conclude by multiplication of the length in the breadth there to be contained 5000. foot.

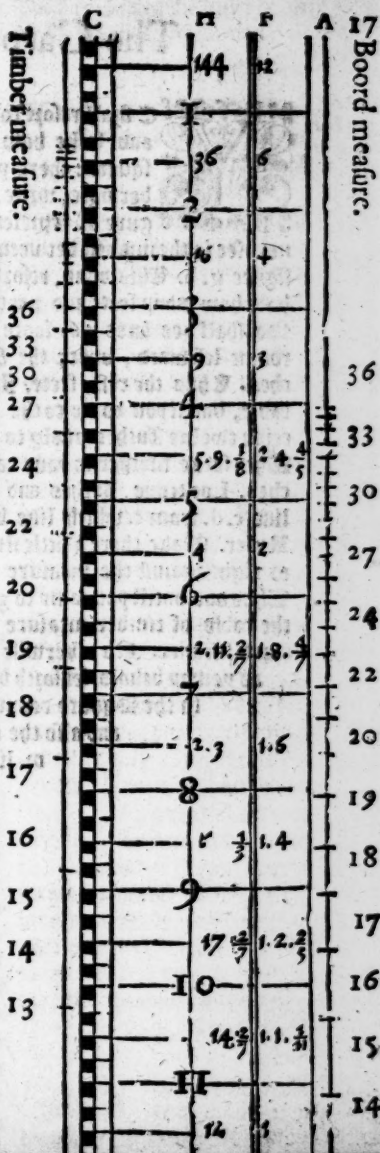
Or thus without Arithmetick, when the breadth exceedeth the Table.

Duide the breadth in parts (as is opened in the Declaration of the table of account) and worke as I haue before instructed. So for pauements all manner of wayes it serueth your turne. Of this matter to put forth tables, were superfluous tediousnesse and folly. The ingenious with these few will be satisfied.

**The face of the Carpenters
Ruler, figured with the
true measures, and other
things necessary.**

BEcause the effect of this Ruler is aboue declared by tables, an instrument also well knowne & common among good Artificers, I will not spend many words in opening it. Behold the figures and learne by them how yee ought to make and commonly to decke your ruler, both with timber and boord measure.

Admit the Ruler to bee a. b. c. d. well plained 12. Inches long, a quarter of an Inch thick, and two Inches in breadth. Truly it were more commodious, if it had two foote in length. This ruler here imagined, but a foote in length is diuided first in 12. euen parts called inches: then euery inch in halfe or two equall portions: each halfe in two quarters: euery quarter in fours or 2. parts at the least: as in this ensample. When are the figures placed from 1. to 12. manifesting the Inches. Thus your ruler is ready to receiue the measures which are marked or figured on your Ruler thus. Adde first the timber measure as fol-

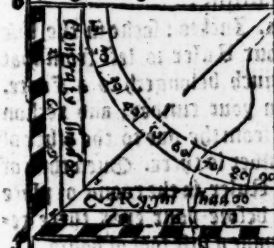


The Carpenters Ruler.

Thath resort to your table of Timber measure, and seeke how many feete belong to one Inch square: there yee shall finde 144. This number note, write, or rather graue, where this figure 1. representing one Inch, is figured as ye may see in the middell betweene the line e. f. and the line of the figure g. h. This done, resort to your table againe, and behold how many feete and parts two Inches square requirerth. So shall yee finde 36. foote, which is placed in the nere roome leftward, under the Character 2. signifying two Inches. Thus the rest, feete, Inches, and parts, found in your table, vntill you come to the 12. Inch, where yee shall perceiue twelue Inches onely to bee set in his proper roome, &c. Then seeke further in your table what belongeth to 13. Inches. Los tenne Inches and 7. This must bee numbrd in the line c. d. from c. which line betokeneth the thickenesse of the Ruler. Make there a little strike vpon that grossenesse, euen or right against the measure 10. What neede many words? Thus doe vntill you come to 36. Inches, and that is noted (as the table of timber measure sheweth) right with one Inch and 7. from c. No otherwile is performed of boord measure, as ye may behold set forth by the helpe of his proper table in the Square roomes beneath the line e. f. and also the other thickenesse of line b. a.

The backside
of the ruler.

Lyre of Scale.



The xij. Chapter.

This other figure i.k.l.m. is the backside of your ruler, having in the midst of Geometrical quadrant n. o. p. q. whose making in few words is thus expell'd. The line of breadth of your ruler n. o. the line o. p. p. q. q. ought to be of one equal length, cutting each other squarewise. And from the centre n. unto p. is drawn another line, which is called the line of height. So is o. n. the line of level. q. n. the line of height. This knowne, I open my compasse, one foot remaining. In the centre n. the other extended in the line of level almost to o. making a circumference to q. n. which is a portion of a circle named a quadrant; and ought to be divided into 90. equal parts, as ye may behold, every of them called a degree. Ye may divide the lines o. p. p. q. named the Scale each in 12. as here, or in 60 pean in 100. equal portions is more meete for the use of shadowes, heights, lengths, &c. Note that the side of halfe Scale, o. p. is called the contrary shadow p. p. right shadow. Remember that upon the thickesse i. k. ye ought to have two first equal square lightes well hoord, represented here by r. s. made of wood, or rather metall to be

The making of
a Geometrical
quadrant.Note these
three principal
lines.The divided
sides o. p. and
p. q. are called
the Scale.

The Carpenters Ruler.

The common vse of the Carpenters Ruler,
touching the Face afore put forth.

The xiiij. Chapter.

The eight
Chap. sheweth
how the true
square is found.



Suppose a piece of timber to bee moaten, whose true square is 7. Inches, this square appointed you to the figure of 7. in the line g. h. under whom rightward in the place assigned to Timber measure is written 2. foot, 11. Inches, $\frac{7}{8}$. As often as that measure is found in the length of your timber, so many foote of timber is in that piece.

Another Ensamble.

Imagine your Square to bee 23. Inches: seeke in the line 1. a. c. Note then how much of your Ruler is left from that to the end of your Rule c: and so much belongeth to a Foote. Therefore lay out the measure vpon your timber, and reckon how many times yee may finde it, from the one to the other of your Logge: for so many foot of timber is there. Euen thus of boord. Seeke the breadth vpon your Ruler, in the roome or place of boord measure, and immediately before your eyes there remaineth what is to be laid out to make a full foot of boord.

The vse of the principall lines in the Geometrical Quadrant on the backside of the Ruler, and first of the leuell line.

The xv. Chapter.



It becometh you to looke through your sights q. n. placed in the thickenesse of line k. m. a line chzed and plummet falling at liberty out of the Center n. If this plummet and chzed chauce perfectly on the line of leuell (which is n. o. whatsoeuer ye see through the sights, is leuell with your eye, if otherwise

The vse of the Scale. 19

wise the thing that yee looke vnto is not leuell, either more or lesse then the height or leuell of your eye: For, if the Plummets fall to you ward: lesse, if contrary.

How by the line of Leuell to forsee whether the water of any Spring or head is possible to bee brought to a place appointed, and also to iudge the wholesomnesse of it.

The xvi. Chapter.



¶ Shall goe to the head of Spring, and set your Ruler to your eye (being in height equall with the water) so that the fine cord and Plummets fall precisely in the line of leuell. Now if through the sights ye may see aboue the place, know and iudge the water possible to be brought: if your sight fall vnder, impossible. It cometh commonly to passe, when the place to the which yee would haue water conueyed, is of any great distance from the head, then Hills, Valleys, and such like impediments, let the line visuall to haue his free course: wherefore this remedie is prouided. At the head of the Spring, ye shall looke thorow the sights (as before) and note a marke in the next Hill toward the place, then goe to the marke in like manner obserue another in some hill: so forth vntill by any of them yee may perceiue the place desired. If then your sight running through the pinnes of your Ruler (the thred euer falling on the Line n.o.) excēde that place, the conueying of your water is possible. Otherwise not.

Now by the way briefly yee shall bee instructed how yee may know the wholesomnesse of water.

How good water is knowne.

Take a cleane pot, and put water in it: so set it on the fire: After a little boyling, powre it out, if then no scum remaine

The vse of the Scale.

maine in the bottome of the pot, it may bee iudged the whole-
somer. Or thus. Let fall drops vpon metall, or rather on
Glass (any of them being polished) and suffer that to drie by it
selfe: if after there remaine no spot or signe, it is a good token.
Moreouer, if your water bee sweete, pure, cleare, light, or of
litle weight, it followeth the water to bee whole some for the
vse of man.

Of the Line of height.

Vhensoeuer the Theod and Plummert doe chaunce
fully on the Height, which is n. p. the Altitude or
Height that yee see is euen with the distance from the middle
of your foote, to the nether part directly vnder the toppe, e-
quall with your standing, adding the Height of your Eye
downeward. Know that yee must euer stand vpright with
Bodye and Necke, your Feet together, the one Eye
closed, &c.

The line of vpright Altitudes.

Iudge also any thing plumb vpright when the thicknesse
of your Ruler i. l. is closely thereon, the plummet then at
Liberty falling on q. n. named the Line of heights vpright. Now
followeth the vse of the Scale.

To search out Heights by the Scale with the aide of two places.

The xviij. Chapter.

Let the Theod and Plummert fall in the one, on the
12. points: in the other Station, on the 6. of the
right shadow: double the distance betweene the
two places, the summittie appeareth from that part
of the thing measured, which is equall in Height with your
eye.

The vse of the Scale. 20

eye. Or the one in the 12. the other in 8. of right shadow: then triple the distance. The one in 12. the other in 6. of right Quadruplace, the space. The one in the 12. the other in 6. of the contray shadow, then the space betweene both the Stations is equall with that yee measure, euer vnderstanding from your eye vpward. Euen that same cometh to passe, if in the one the Thred bee found vpon the 6. of the contrarie, in the other on the 4. of the same, or the 4. and 3. of the contrarie. In all these the spaces are equall with the Altitudes. So then in measuring the distance betweene the two places, yee haue the height from your eye vpward, putting to it the length from your sight downeward, the whole Altitude appeareth: the Base being equall with your standing.

I would not haue you ignorant here how to know lengths which be in height not easie to come vnto. For (as before) get the height of the toppe, the Altitude of the Base or longest part of your length. Subtract the lesse height out of the more, of force your desired length remaineth. Or thus: Let the plummet and thred fall in the 12. Marke your place: goe in toward the thing (the thred as it was) vntill yee see the Base of that length: the distance betweene the two standings, is vndoubtedly the Length.

How lengths
in height are
knowne.

How with Scale direct or vpright
heights by their shadowes are
declared.

The xix. Chapter.



Turne your left side vnto the Sunne, suffering his Beames to pearce both your sights q. r. placed (as afore is said) in the thickenesse of line k. m. The Thred or Plummet then hanging at liberty, out of the Center n. sheweth as well the Degrees

The vse of the

of height to bee counted from 0. as the parts of the Scale cut. If your thzed bee found in the 12. part of line of leuell, shadows of all things being perpendicular eleuated, are equall with their bodies. If the plummet with the thzed bee perceiued, cutting the parts next to the sights, which I name points of the right shadow, then euery thing direct is more then his shadow, by that proportion which 12. exceedeth the parts, where the thzed was found. If it fall in 1. that is the first part of the right shadow, take the shadow twelue times, to make the height. In two, that is the second part, sixe times, in the third, foure times: in the fourth, thzee times: in the fift, twice: and $\frac{1}{2}$. of the shadow, in the sixt, twice, in the seuenth once, and $\frac{1}{2}$. in the eight once, and $\frac{1}{2}$: in the ninth once, and $\frac{1}{2}$ in the tenth once, and $\frac{1}{2}$: in the eleuenth ye shall take the shadow once, and $\frac{1}{2}$. part of it.

Right shadow. If the Art of numbring were had, I would will you to multiply the length of the shadow by 12. and the product diuide by the parts, in the which ye found the thzed.

Contrary shadow. But if it bee in the parts of the contrary shadow, augment the length of the shadow with the parts declared by the plummet: and the increase diuide them by 12. so commeth the Altitude also.

Thus the composition and whole appliance of the Carpenters Ruler is shewed: therefore somewhat shall be now said of the Squire.

I am not ignorant that the common vse of him, is better knowne than I can with many words expresse, wherefore I leaue to write in that behalfe. Notwithstanding I will declare how Heights and Lengths are taken, &c. matters rare and knowne of few Artificers.

Also by Tables to get a true knowledge of the day houre, and that diuerse wayes, with the helpe of the Squire, as is opened in my generall Prognostication, augmented in the yeere of our Lord 1556.

Carpenters Squire.

21

What length the sides of thy Squire ought to bee, and the diuision of him.

The xx. Chapter.

I Neede not to put forth the exact making of this Instrument so well knowne. Lo therefore the figure. One side supposed two foote from the inward Angle: and the other a iust foote from the same. The longer a. b. inwardly diuided from the Angle a. vnto b. into 24. equall principall parts, and euery of them into a lesse (if ye list) each containing 10. minutes, also the side c. d. in the outward contrary, plaine from the top c. vnto d. is diuided into 12. euen portions: and againe (if yee require exactnesse)



euery of them into 6. each of value 10. minutes: Behold a line and plummet falling from c. to f. a Parallell to c. d. and a. b. Thus this squire is well framed for the vse of diuers Tables put forth in my generall Prognostication, and also for the finding of Altitudes and Longitudes, which here I purpose now briefly to open.

How by the Squire heights are knowne.

Altitudes or heights are found, the line of plummet centered in the first point, cutting h. the middle of a. g. The moueable

The vse of the

imouable sightes placed in a. g. or a paralell from that line not vnlike, as is opened of the line of height, in the backe of my Ruler.

How Lengths in plaine Ground are searched by the Carpenters or Ma- sons Squire.

The xxi. Chapter.



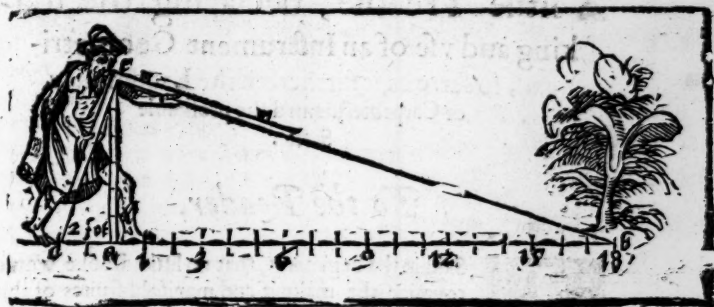
Take a staffe diuided into certaine portions as pee list, in a 100. or a 1000. parts. At the beginning of your length, vpon the very toppe directly standing, set the inward Angle of the Squire: lift vp or put downe this instrument, vntill you see the furthest part of your Longitude, I meane vntill your sight running from that Angle, to the end of your Squire, come vnto the furthest part of that length. The Squire so remaining, and the Staffe not remoued from his height. Marke where the other end of the Squire next vnto you stood vpon the ground. See what proportion the Staffe then beareth to the part of the ground, which the nearest end of the Squire pointed vnto from the Staffe: the same shall the Length haue to the quantitie of the same Staffe.

Ensample.

The cause is
taken out of
Euclid. 33. pro.
1. Booke and
the 4. pro. 6.
booke.

The Staffe a. c. in this figure is imagined 6. Foote, and the space a. d. 2. Foot. Considering now that 6. the length of the Staffe containeth 2. thice, therefore the Longitude desired, a. b. of force must containe three times the Staffe (which Staffe is 6. Foote) that maketh 18. Foote. As this is proued true by a small ground in the figure following: so the Art faileth not in a greater space, which the good Speculator

Speculator and diligent Practiser by any way cannot denie. Yet experience willethe me this to confesse, that the Squire is not convenient for any long distance, but the Instrument Geometricall (whose making and vse yee may perceiue in the Treatise following) vnlesse yee ascend some Tree or Turret for your ayde, which length knowne, shall stand in stead of your Staffe.



A Note.

It behooueth you to haue a fine cord, made fast in the upper part of your Staffe. c. which shall bee tyed euē with the inward edge of the Squire, and so drawne to the ground, where the neere end of the Squire from the Staffe pointed, as ye see, d. c. the other end then truly directing to the furthest distance.

Know that the ground must be very plaine and leuell, otherwise error ensueth.

Thus the vse of the Squire is heere somewhat declared, but more in my generall Prognostication, yea most plentifully hereafter (God sparing life) in a Booke titled, The rare vse of the Squire in practises Mathematicall. In the which Booke profitable pleasant experiences shall bee plainly opened (onely of me practised) as well of Perspective, as of the Mathematicals in generall.



A little Treatise, declaring the making and vse of an Instrument Geometrical, so farre as it furthereth the Landmeater or Carpenter, named the profitable Staffe.

To the Reader.



Said in the beginning, that no little Booke would containe the making and manifold fruites of this princely Instrument, if it were set forth as it ought to bee in his perfection. Certes the trueth euen here maketh me confesse the same: yea that there is no Instrument so generall and profitably pleasant: Norwithstanding know (gentle Reader) that the occasion of his chiefe vse and profit is not heere ministred: neither, to say the trueth, doth it appertaine to, or agree with the capacitie of such Artificers. Therefore I shall leaue to intreate of his ample large vse and best making, and will set him forth in few words: yea sufficiently for the Land-meaters capacitie or Carpenters purpose, that at the least, they may receiue some kinde of fruites with the Geometrer. And in time to come (by other meanes) as I see cause, I will largely declare, and there decke him with his proper beauties. Here now followeth the making, and so briefly, how he is applied for the profit of the aforesaid Artificers.

The vse of the profitable Staffe. 23

The making of this profitable Rodde or Staffe.



Y^e shall prepare two small, streight, stiffe, round, or rather square rods of mettall or of wood, well plained of like bignesse and length. Although it make no matter of what length, yet to auoide the errours, which little instruments, and short stauers bring, and also to beare with the rude vnwonted handling of such Artificers: let our Rods bee each five, or at the least thre foote, and euery foote divided in 12. euen parts or Inches, as yee see a. b. and c. d. These Rods must bee forged with a voyce in the end of them to ioyne readily tenne or fife foote in length, (when time requirerth) as the figure e. f. sheweth. Also yee must get (by the helpe of some Craftzman) foure other like Rods, the longer g. 2. Foote: the next h. 1. Foote: the other i. 6. Inches, then k. 3. Inches, the last and shortest l. 1. Inch, and $\frac{1}{2}$. Each of these must haue in their middelt a hole, that the long Staffe of ten foote may bee put through them, and they moued

on him at pleasure by and downe, alwayes cutting the longer Staffe e. f. Squisewise, and made to carry on any diuision,

3. Inches.



1. Foote.



These Staffe divided in 5 foote, or 24 60. y^ell.

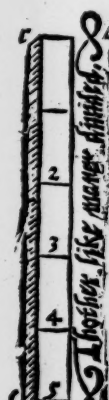
6. Inches.



2. Foote in length.



Bothe yownd in or, 16. f. h.



Together like manner divided.

The vse of the

an occasion shall be giuen: which all are easily to bee perceiued by the figure following, although my rude declaration hath not expressed my meaning.

Here note in the head of your short staves, yee may haue one crosse staffe two foote long, with currant sights, so artificially made, that alwayes the short staffe shall runne squire vpon the longer, and the sights distant, as ye list to place them.

Things needfull to be knowne before the vse
of this Instrument is opened.

The ij. Chapter.

BEfore I intreate of this vse, it behooueth to knowe things necessary, and first which of the fīue little staves g.h.i.k.l. mentioned in the making is to bee put vpon your long staffe c.f. according to the distance of the marke. Note if your marke be neere hand, be it length, breadth, or heighth, the longer g. doth seeme meetest to haue the roome, if more of length, the other h. and so the further distance, the shorter the staffe requireth to be, which shall occupie that place. Oft practise sheweth this better than many words. Also note, if chance bee to goe in toward your marke, (as after ye shall see how) you must remoue the short staffe inward more neere to the end of the longer c. If ye bee compelled to goe from it, then put it from c. toward the end f. Also remember when ye are appointed to measure any breadth or length (as shall be declared) it behooueth you to stand right with, and against that breadth: yea, and the longer the breadth or larger the wideness or length is, the better the thing will come to passe. And for heighes it is necessary (if yee regard all precisenesse) to haue the heighth stand directly by.

Note this that followeth to be generall
in all workings.

Ye must stand right by with your Bodie and Necke, your feete iust together, your hands not much moving, the one
eye

eye closed, and euer marke your standing right with the midst of your feet. Bee not ignorant here, that I call the extremes of the little stauers, the very ends where the sight euer runneth. And no difference betweene the Altitude and height, betwene the Longitude and length: the Latitude and breadth. The short stauers I name by the letter figured ouer them. Your eye must euer bee placed in the end of the longer staffe c. and with the other eye ye ought to winke.

What these words mean, Longitude, Latitude, Altitude.

These trifles and such like omitted, letteth the trueth to come to passe, and make men to suspect the Ground, which is most certaine.

How heights standing directly vp, are measured by the instrument.

The iij. Chapter.

At the staffe g. vpon the longer c.f. and moue him his iust length from the beginning of the longer c. turne the ends of g. toward you, and according to that height placing your eye (as is said) euer at the beginning of the longer c. with the other eye winke. Then go backe vntill ye may plainly perceiue the very vpper part of that Altitude, and also the lower end by the extremes of your shorter staffe g. Now the space of the middle of your foote to the base of the height is equall with the Altitude.

Or thus.

When ye shall see any Altitude, whose measure ye require, imagine by conjecture how oftentimes that height is found in the space from it vnto your standing. Then moue your shorter staffe (chosen as aboue most conuenient) euen as often his owne length from the beginning of the longer c.

where

The vse of the

where your eye is euer placed. This done, turne the ends of your little staffe, your eye being in c. according to the height: looke whether pee may see by the extremes of your shorter the very top, and also the lowest part of the height. If not, moue the shorter a length further toward f, or neere to c. as pee see cause, and as your coniecture failed. Or let your little staffe remaine, as by coniecture hee was put, and goe toward o from that height, vntill the Altitude agree iustly with the extremes of your short staffe. Then marke that place with the middle of your foote.

Now ye may conclude, that the height is as often contained in the distance, which is betweene the marke and it, as the length of that little staffe is found remooued from the end of the longer, &c.

Ensample.

How the iust
height is
knowne,

If the short staffe bee tenne times his owne length from c. affirme the height contained in that distance ten times only.

The Altitude is thus gotten. Mooue your short staffe from his late being a length either toward o from c. as pee list to goe in o backe. Then goe fro o neere vnto it (as before) vntill the very summie, and also the lowest part of the height agree with the extremes of your shorter staffe. The space then betweene your marked place and this latter, declareth the iust height. Oftentimes through impediments, pee shall not haue room to goe so farre backe o forward, as the height cometh vnto. This remedie is provided. Mooue the little staffe halfe his length, and so seeke two stations (as before) vntill the extreme of the shorter staffe bee found iustly to answer either end of the height. Then the space betweene the two standings must bee doubled to haue the iust height: or if ye list, pee may moue the shorter, according to the fourth part of his length, or to any portion, as to the fift, sixt, twenty, &c. then shall pee haue that part of the height betweene the two stations.

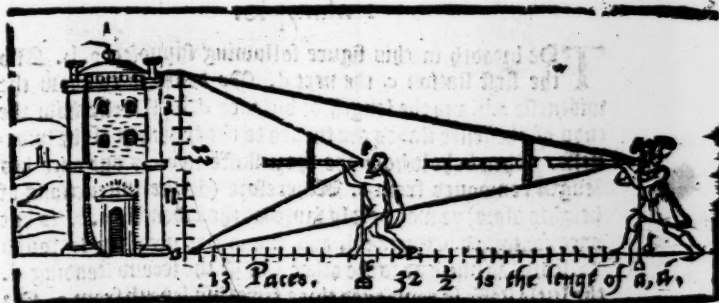
A remedie pro-
vided for want
of ground.

Yet know this (which experience by diligent practise will shew) the bigger parts we take the lesse error we commit. A little error often multiplied, encreaseth to a great.

Now that all the aforespoken may the better be perceived, behold the example ensuing, as we may see by figure declared, in the which the height is imagined a.b. the first station c. the short staffe g. is moved from c. to his length. I am forced to conclude, that the Base of the height a.b. is from my standing e. even his precise length. So then if you measure that distance of a.c. being 13. paces, we have the true height of a.b. as many. In the other standing place d. the shortest staffe is found from c. twice his length and a halfe, wherefore I must affirme the height a.b. to be contained or found in the distance a.d. twice and a halfe: which length a.d. is apparent 32. paces. All this that is spoken of the height, may well be understood of Latitudes or widenesses, and lengths following.

The ground of this may be gathered of Euclide in his perspective, 21. Theor.

In Altitudes this rule is not perfect, except the eye be levelled with the middle of the Altitude.



The vse of the

How the breadth or widenesse of things
are found, and by them, Length or any
distance at pleasure.

The iij. Chapter.

Whatsoever I haue instructed afore of heights,
the same vnderstand here of widenesse, lengths, &c.
For none otherwise are Latitudes or widenes-
ses searched by this Instrument, then before is
declared of heights, onely this excepted, that the
short staffe must lie contrary, the ends according to the breadth,
seeing by the extremes of the short staffe, the very uttermost
parts or ends of the Latitude, noting your stations right with
the midst of your foote. And so performe all as tofore. And as
I said, thereof the parts of the height found betweene your
standings, euen the same things is well bled here, for all man-
ner parts of the breadth.

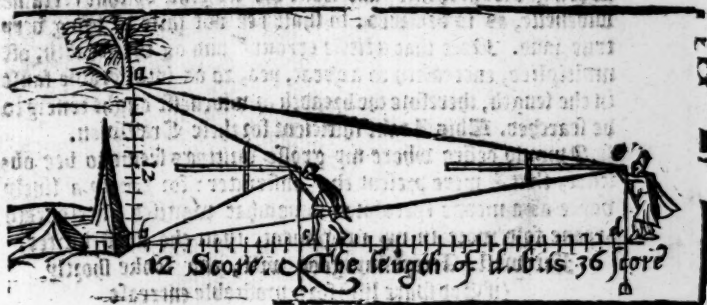
Ensample.

The breadth in this figure following supposed a. b. Also
the first station c. the next d. My desire is to know the
widenesse a. b. and the length or distance d. b. Marke how the
ends of the lesser stauies are turned to the extremes of the wide-
nesse. Then behold how the short staffe in c. is but once his
length remooued from c. Therefore (by the instructions of
heights afore) ye may boldly say, that the widenesse a. b. is but
once contained betweene d. and b. and that measure is found
12. score, as much as is the other a. b. In the second standing d.
the little staffe is remooued three times his length from c. For
that cause I conclude (and truly) from b. to that station three
times the breadth, which breadth is 12. score. So by the
widenesse I haue found the length of b. d. 36. score, my desire.
Thus are Latitudes found, and by them lengths, &c.

Behold

Behold the figure.

Ye must alwayes stand directly against the middle of the Breadth.



Whensoever any distance is put, whole certaine length yee require: measure (by the arc expressed) either the height of any thing there found, or the breadth, and see how oftentimes that widenesse or length is contained unto your standing: which knowne, the length cannot be hid, as is declared.

NOW in few words to conclude, yee may by this Instrument measure the distance of Houses, Steeples, Trees, the length of Wallles, the breadth of Ditches, Images in height, and such like. The good wittie Carpenter standing in a place, where hee may plainly see a whole house, or any manner frame with great pleasure, may by this get speedily the true proportion of that house, which hee ought to note in a Table, and when time cometh (not without his great praise) may make, reare and set vp the like. This I take to be sufficient for these Craftsmen.

A more larger
vse of this In-
strument.

I haue

How the length of land is exactly found

I came before forgotten to admonish you whensoever pee list to measure any land, especially by the Instrument Geometrical, named the profitable Staffe, to set bright a Rood, the length of a Bearch. Or if the distance be long, to passe on, or rather fully mete thre or more Bearches, at the end or head of your length; the extremes noted with two visible marks. When goe from thence, and seeke the lengths by that certaine wideth, as is declared: so shall pee not faile to bring very true land. Note that a little error found on the breadth, is multiplied, encreaseth to a great, yea, to an intollerable fault in the length, therefore the breadth or wideth ought truely to be searched. This I leave sufficient for these Craftsmen.

I would believe, where my groſſe writings ſeem to be obſcure, that I were preſent the Indiſtinct: for truly a lively hope of a meaner ſpeculator ſomewhat pleaſed, furthereth ſome ſold more to my judgement, than the ſuch writer.

Farewell. Accept my good will, and look hopefully (if God spare life) for a profitable increase of these matters.

FINIS

